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EKISTICS

REVIEWS ON THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

ΟΙΚΙΣΤΙΚΗ

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THE TITLE EKISTICS comes from the Greek verb OIKO, meaning settling down, and demonstrates the existence of a science of human settlements conditioned by man, influenced by economics, sociology, geography and technology.

PUBLICATION OF EKISTICS is once a month. Its purpose is to develop an interest in a more comprehensive approach to the problems of human settlements. It is addressed to all those interested in the planning and building of better settlements. It can be obtained in exchange for other related publications or by subscription.

All manuscripts, reports bulletins for review and other communications should be addressed to the Editor.

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EDITORIAL OFFICE
20-A Prescott Street
Cambridge 38, Mass.
USA

PRODUCTION OFFICE
Doxiadis Associates
24, Strat. Syndesmou
Athens, Greece

EDITOR
Prof. J. Tyrwhitt

PRODUCTION EDITOR
J.C. Piperoglou

ASSISTANT EDITOR
Gwen Bell

PRINTER
N. Tiniakos
25, N. Halkidonos St.
Athens, Greece.

PUBLISHED BY: DOXIADIS ASSOCIATES - Consulting Engineers
24 Strat. Syndesmou, Athens, Greece - Tel. 623.901 - Cables: DOXASSOC

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July 1961 Volume 12: Number 69

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EDITORIAL

This first issue of volume 12 of EKISTICS opens with the abstract of a long article on C. A. Doxiadis which appeared in the leading architectural journal of the USA -- the Architectural Forum. Much of its content is already familiar to readers of EKISTICS. Considerable play is made of the fact that a good deal of Doxiadis practice is based on other people's theory, much of which has never before been actually built. But there follows a discussion of Doxiadis' theory of Dynapolis, which is still controversial. In this context we may turn to two other abstracts appearing in this issue: one a plan for the future of Tokyo -- a tour de force of urban design -- the other a prognostication of the future development of Minneapolis/St. Paul -- a tour de force of statistical technique. Though worlds apart in location and approach, both come up with a lineally directed, open-ended city -- Dynapolis.

THE ROUTE AS A GENERATOR OF URBAN FORM

Lineality and movement have ever been connected, and the next six abstracts are related to the present focussing of concern upon this approach. The proposal for the future of Tokyo by Kenzo Tange is both dynamic and urbane. It is a dynamic extrapolation of the linear city idea, and a refinement of the notion of the core of the city as organizing element of growth. It is the direct outcome of the experimental plans initiated by Tange when teaching at MIT (EKISTICS 11:68) and handles the lineal growth of the urban core as a continuous three-dimensional design, using the highway system as the chief element of the structure -- horizontally and vertically.

Erdsiek's analysis of "The Face of the City" is in fact concerned solely with urban design aspects of the urban street -- a street bordered by buildings. His methodological studies of relations between solids and voids along a lineal route could however be applied at almost any scale, from the huge scale of cyclical traffic in the Tokyo project to pedestrian paths in a "Radburn type" residential district.

Two brief articles follow on ways of more efficient movement of the single individual at something near pedestrian speed: the moving pavement and some examples of "minimum transportation vehicles".

In lower density residential areas, the route is still a major form-giver. Thus there is a continued pre-occupation with solutions of 'Radburn-type' residential planning, in which one side of the house is organized in relation to a pedestrian oriented world, designed to the 'human scale'. Paul Ritter's assembly of comparative studies is continued in this issue, and is followed by a modest urban renewal project in Cincinnati by Doxiadis Associates which incorporates two interesting features (apart from its low cost): an American variant of the 'maisonette' type of row-house, popular in England, in which a two-storey house is built over a one-

storey garden-apartment, and a further example of the 'Radburn-type' pedestrian approach.

STATISTICS AS GENERATORS OF URBAN FORM

City planning is frequently accused, not without right, of having abandoned design for statistics. It is more truly passing through a phase in which many leading city and regional planners having abjured all inspirational design theories, are trying to derive design principles from statistics via 'the scientific method'. Much work of great value is emerging as a result of this approach, though its use as a design determinant is still naive.

First comes a study by a geographer of the growth of the twin cities of Minneapolis/St. Paul, introducing a brilliantly simple method of rapidly obtaining an objective index of the trends of settlement. It contains one major flaw. It assumes the factors which produced growth in the period 1940-1956 continue unchanged. Since these were largely stimulated by one governmental action (FHA Loans) and since a new, and as yet unmeasured, government action is now in play (Urban Renewal) this assumption is unwarranted. This does not however affect the merit of the technique employed. It only means it is insufficient of itself.

The next article by an economist deals with the hidden costs of urban sprawl in the USA by pointing to the lower costs of concentration. He further indicates that the real cost increase of suburban growth over concentrated growth during the four years 1953-57 amounted to the staggering figure of one per cent of the gross national product. This is, as he suggests, significant enough to warrant further intensive study and presumably, as he does not say, constructive design proposals.

The central business district of American cities (CBD in current jargon) has given rise to innumerable statistical studies, mostly aimed at finding out how it can be made to pay its way without altering systems of taxation. John Rannells, who has already written a book on the subject, here contributes a useful review of a number of current studies. He concludes that the economic models used as theories have not been sufficiently refined or tested to be conclusive and that much more research is needed.

BUILDING GROUPS AS GENERATORS OR URBAN FORM

The two last articles deal directly with architecture: the first an architectural evaluation of the emerging forms of USA CBDs, the second with a discussion of the 'Institution' as an urban form-giver. Blanche Lemco Van Ginkel, author of the first, was also present at the latter. She comes out strongly in favor of a total concept of form, rather than an assembly of 'project plans', such as are developing under Urban Renewal practices. The concept she favors is an overall open-space plan (such as the Philadelphia 'greenway' plan) but as two scales of movement: a small scale at the level of the human eye moving at pedestrian speed, and a large skyline scale of widely spaced masses.

The final abstract of a Harvard conference discusses the limitations of the plans of five urban institutions as generators of urban form. Its conclusions are indefinite, but can be related to those of the previous article though one notion emerged which may prove fruitful: the idea that 'project plans' presenting a clear-cut 'edge' can more readily form part of an intelligible urban framework. There was also a general impression that it was really necessary to have an overall heirarchical plan of values within which the individual project could recognize its especial position.

Abstracted from "Architectural Forum" Volume 114. Number 5. May 1961. Pages 112-116, 154B.

THE REMARKABLE DR. DOXIADIS

Ezra Ehrenhrantz and Ogden Tanner

1. Among the more persuasive -- and successfull -- architect-planners currently plying the international circuit is an urbane, energetic Athenian named Constantinos Apostolos Doxiadis, who in less than a decade has built up possibly the largest, certainly the most remarkable, city planning practice in the world. From his handsome modern headquarters looking out to the Acropolis, 48-year-old "Dinos" Doxiadis and his tightly run organization of some 500 employees range out to 13 branch offices and twice as many current projects (See Cover Map). At home, they are building a music center for Athens, planning the development of its 25-mile-coast-line (EKISTICS 11:66, 281-310), and engineering 500 miles of highways through Greece. In Baghdad, they are guiding the expansion of the city, and, in fact, the entire housing program for Iraq. In Karachi, Doxiadis Associates are building a huge new satellite town for 500,000 refugees, and reaching north to lay out Pakistan's brand-new capital of Islamabad (EKISTICS 10:62, 410-439). They are sometime planning consultants to seven other Asian and African countries, the United Nations, and the World Bank. Their latest beachhead is the U. S. itself, where Doxiadis is being doted upon by some and damned by others, and despite both is telling Americans some things they may need to hear.

2. Doxiadis' invasion of the United States ranges from minor planning studies in Oklahoma to a comprehensive report for Washington's own Redevelopment Land Agency (EKISTICS 8:48, 293-309), from a garden cooperative project in Cincinnati for Reynold Metals (see pages 32 & 33) to a river-front redevelopment in downtown Louisville for the same company. But the planning plum, so far, is Philadelphia's 2,500-acre Eastwick project, biggest redevelopment area in the U. S. (EKISTICS 10:59, 195-220).

3. The doctrine of Dr. Doxiadis is not so much a brilliant original as a distillation of many old and new ideas, assembled into a new framework and delivered with occasionally spellbinding effect. Doxiadis the Greek, of course, has a word for it: "Ekistics," the science of human settlements (derived from the Greek word for home, on which the English words "economy" and "ecology" are also based).

4. It is the thesis of Ekistics that while man spends more time and money on his physical environment than on anything else, and while major efforts have been made toward an environment in which life can thrive and expand, seldon has a coordinated, national result been attained. Even a

clear definition of a body of pertinent knowledge to build one, and a term for it, have been lacking, say the Ekisticians. Ekistics, then, tries to fill the gap by widening the planning to everything from dwelling units to regions to bring together not only the architect, the engineer, and the city planner, but, on an equal footing, the sociologist, the economist, the geographer, and other specialists as well.

5. The Failure of Planning. "There is practically no place in the world," says Doxiadis, "where dwellings keep pace, quantitatively or qualitatively, with population growth and economic developments in general. There is no branch of the technical sciences with lower per-capita productivity than urban construction. The most retarded technicians are those who build our cities. City planning has not become a science; it is mainly a technique to handle the problems of the cities after the industrial revolution. We are unable to face problems of a different stage of development in a different part of the world. The best illustration is the failure of Western planners to train planners for the underdeveloped countries, and the failure of planners of underdeveloped countries who have been trained in the West to adjust their concepts to their own habitat."

6. "We have been trying to build a picture of human settlements by studying one case, the industrialized cities of the twentieth century in the Western World. This is very much like trying to conceive the evolution of species by studying only one species of animals."

7. "The American city," Doxiadis continues, " is a city built for man but invaded by the car; it is a city in transition, caught between two phases of development. It is no longer built on the modulus of the human being, but it is not yet built for the car. It can therefore satisfy the needs of neither."

8. "In contrast to the jungle-type development at the center of American cities, the outskirts are reminiscent of large nomadic settlements of people living in their carts, ready to move at a moments notice -- communities without any of the characteristics of permanency and cohesion. The new communities were socially misconceived; they were built primarily to accommodate the car. Walking distances necessary for the development of the social and economic bonds of the community have been abolished. Suburban settlements are more costly than they ought to be: more land is used up per house unit; utility lines are extended and cost considerably more than they should. The cost of operating all services is unreasonably high because of spreading. It is even more disturbing to consider the nervous tension and frustration the average American undergoes daily in getting to and from work."

9. "The U. S. is the first nation in which the big new urban problems have appeared. It is the first nation which had to pay for a tremendous industrial development by losing something of its normal way of living. Before it is too late, an end should be put to the transitional phase; new, radical solutions have to be adopted for the American city if we want to guarantee livable conditions. The efforts of the planner, however, will be handicapped unless there is a national plan for the organzation of urban life on a national level. The house, the street, the square cannot be studied and designed as independent entities but have

to be viewed also as parts of the whole, the city. Cities themselves must not be faced as independent problems, but seen as interrelated parts of a national program covering the total settlements of the nation."

10. "The size, complexity, and development of the problems of human settlements influence more than anything else the lives of men," Doxiadis sums up with a sweep of the hand. "They are an expression of history, civilization, but more than anything else, they are an expression of the degree of happiness of the people living in them. Our contemporary problems are the phenomenenal increase in population, the impact of the machine, the gradual socialization of society. The modern city is spreading all around endlessly and continuously. In the modern city the fourth dimension, the dynamic growth through time, is the dominant one."

11. "From what I have seen," he concludes, " I am very strongly inclined to believe in the need to create a new American city rather than try to remodel the existing one."

12. "Dynapolis" or "Miracle Miles"? This, of course, is where Doxiadis begins to cross swords with other planners, some of whom are pretty able spellbinders themselves. Victor Gruen, for example, agress with Doxiadis' not-so-new principle of the superblock to separate pedestrians and cars but violently disagrees with what Doxiadis calls his theory of "Dynapolis" (EKISTICS 9:51, 5-20): an open-ended city whose core can grow in one direction, keeping new residents always conveniently opposite their work. "More 'Miracle Miles'", groans Gruen. "Our downtown cores are already much too large and loose, including many uses which don't belong. The job is to tighten up this inner sprawl, not eat up more and more land by elongating the city core, and having the older end die off." Dynapolis has its defenders too, among them, Director John Searles of Washington, D. C. 's Redevelopment Land Agency. Says Searles: "He has a remarkable ability to see all the different forces at work, the forest for the trees. The open-ended city, for one thing, prevents you from strangling yourself inside a fixed highway loop." Other planners respect Doxiadis' general principles, and his energetic salesmanship and managerial capacities, but find much old internationalist dogma in the authoritian, inhumanly repetitive quality of his vastscale master plans.

13. Sectors and Superblocks. Like most of Doxiadis' city plans -- including Eastwick in the U. S. - Baghdad is laid out on a repetitive grid of giant "sectors" separated by major high-speed roads. A typical sector can be from 1/2 mile to 1 mile on a side, and is penetrated only by dead-end feeder roads or cul-de-sacs. In Baghdad sectors, each handful of houses, bunched close to its own alley for shade, has its own little community space or "gossip square" where neighbors can meet, mothers chat, children play. (The equivalent in Eastwick is a small "tot-lot" or park.) From these small focal points a system of pedestrian malls and squares. The community centers of adjoining sectors

are joined to form a continuous core, which can be expanded along its axis as the city grows. Depending on its function, the city also has its own groups of sectors for industry, federal government, special sport centers, or major parks. But in none do cars endanger pedestrians nor do pedestrians slow the efficient speed of cars.

14. The superblock, to be sure, is nothing new. It dates back before Planner Clarence Stein developed it for single park-like residential communities fed by cul-de-sacs, like Radburn and Baldwin Hills, and Victor Gruen and others adapted it to whole downtown areas of the city, starting with Fort Worth. Doxiadis simply adapts it to all areas of the city, as a unit in an over-all grid of the city block now outmoded by the onslaught of the car.

15. "Our settlements," says Doxiadis, "have changed scale, or rather they have had a second scale, that of the machine thrust upon them. Now it must be a combination of scales -- that of man, the automobile, the airplane."

16. Aside from the considerable contribution Doxiadis Associates is making in organizing settlements of under-developed countries, his prinicples of planning are beginning to strike home in the highly urbanized -- and highly disorganized -- metropolises of the U. S.

16. What annoys some of his U. S. counterparts is that Doxiadis, in his spellbinding of potential supporters, does not give credit to the ideas of pioneers in the field and city examples of their work as precedents for his own. Others feel that his actual plans, born of trying to house vast numbers of refugees in government-directed communities abroad, lack some of the warmth and human texture that American neighborhoods demand. With some exceptions -- notably his own Athens headquarters and his "courtyard" houses in Iraq -- Doxiadis' architecture is not up to the standard of his planning. But then, as he says, he is not concerned primarily with innovation for its own sake. He does not try to design a beautiful building or a beautiful city so much as a building or a city that functions well.

Abstracted from "The Japan Architect" April 1961. Pages 8-38. Translated by Charles S. Terry.

A PLAN FOR TOKYO, 1960

Kenzo Tange Team

1. Last month EKISTICS presented portions of Kenzo Tange's notions of future city form as evidenced in the Kurashiki City Hall and a project under his tuition at MIT. This is a further development along the same lines and a much grander scale which he undertook to develop with Sadao Watanabe, Koji Kamiya, Moriaki Kurokawa, Arata Isozaki, and Heiki Koh.

2. In drawing up a plan for Tokyo, our first task was to determine just what the functions of great cities are today, and how they differ from the past. Our studies lead us to the conclusion that the city of 10,000,000 is of fundamentally different character from a city of 100,000 or 1,000,000 and that its needs cannot be met by the same means that have been employed in the past. In the latter half of the twentieth century it will become increasingly necessary for society to face up to the difficulties confronting the mammoth cities, to overcome the inconsistencies, and to give expression to the true nature of such cities. The responsibility for creating new urban systems that will satisfy human hopes is ours.

3. We have drawn up a plan which will, we believe, change the old Tokyo in such a way as to make it capable of containing the new mobility and activity of the times. The plan calls both for the gradual reconstruction of the existing city and for expansion into Tokyo Bay -- two movements which, in our opinion, will aid each other along.

4. THE NATURE OF A CITY OF 10,000,000. People say that the organization man is alone, but even more alone is the man who is separated from this network. It is in order to connect themselves with this network that people gather in the cities. The telephone, the radio; television, the portable telephone, the video-telephone -- all these indirect means of communication give rise to a greater demand and need for direct communication. When men carry messages, when they attempt to preserve the links between the various functions, there is a flow of movement, and it is this movement that makes the urban organization an organization. The city of 10,000,000 is an aggregation of a moving, flowing population. Tokyo, then, is not merely a collection of people and functions. It is also an open organization in which the various functions communicate with each other and create the total function. What gives this organization its organic life is the flowing movement of the 10,000,000 people who are engaged in the communication functions.

5. The cities of 10,000,000 have appeared in the course of the movement of population into teriary industries. In the last century the people engaged in secondary industries have continued to make up about 48% of the English population, but those engaged in primary industries have decreased from 22% to 5% of the total population, and those engaged in tertiary industries have increased from 30% to 46% of the total population. During this time the population of London has grown from 3,000,000 to 8,700,000. In the postwar period the English, adopting the tradition of the garden cities, have built eight satellite cities around London, creating residences for 130,000 people and working places for 60,000, but these satellites have not prevented London from growing to its present size.

6. In Japan the portions of the population engaged in primary, secondary and tertiary industries at the beginning of the twentieth century were 72%, 13% and 15% respectively. At that time the population of Tokyo was 1,400,000. In the ensuing period, during which the shift to secondary and tertiary industries has proceeded simultaneously, the population of the city has grown to a 1960 level of 9,670,000.

7. The city of 10,000,000 is essentially an organization which supports the activities of tertiary industries. About 58% of the people in Tokyo are engaged in tertiary industries, as compared with 62% in London and 67% in New York. Economic expansion is causing an increase in the relative importance of circulation rather than actual production, and the pivotal functions involved in the process of circulation are centered in the cities of 10,000,000. Accordingly, government, economy, the control of production and consumption, and cultural activity have come for the most part to be centered in these cities, forming complexes which control the fates of whole nations. The so-called second industrial revolution which is going on today will doubtless strengthen this trend.

8. A PLAN FOR TOKYO, 1960 -- A PROPOSAL FOR A CHANGE IN STRUCTURE. We are not trying to reject the Tokyo that exists and build an entirely new city. We wish instead to provide the city with a revised structure which will lead to its rejuvenation. We are talking not merely of "redevelopment" but of determing a direction along which redevelopment should proceed. Redevelopment that is not orientated in a definite direction cannot solve the problems that face Tokyo. In our proposal, the basic aims of redevelopment should be as follows:

a. To shift from a radial centripetal system to a system of linear development.

b. To find a means of bringing the city structure, the transportation system, and urban architecture into organic unity.

c. To find a new urban spatial order which will reflect the open organization and the spontaneous mobility of contemporary society.

9. The redistribution of factories throughout the country is doubtless a necessary measure, but even if all the factories were moved to the southern tip of Kyushu the tertiary industrial population which controls economic circulation would still be concentrated in Tokyo. Plans to move factories are not without significance, but they will not solve Tokyo's problems.

10. The transfer of industrial facilities to satellite cities is subject to a similar criticism. It would be fine to create satellites in which a certain proportion of the population would be able to live in green surroundings, but the satellites would not solve the basic problems. Even if they flourished, as long as they remained satellites they would merely add to the burden of the urban nucleus. Furthermore, the experience of London with satellite cities indicated that when young people raised in the satellites come of age, they tend to crowd back to the central area.

11. The dispersion of functions is another possible measure. Doubtless it would be an improvement to remove unnecessary functions from the city. A movement of this sort has been going on in America, where various types of installations have been moved from the centers of cities to areas along the high-speed highways that radiate from the central area. Such is the case with shopping and amusement centers, which naturally gravitate toward residential areas. Even in Tokyo there is a tendency for the Shinjuku sub-center to become the nucleus of economic consumption.

12. Still, if the tertiary productive facilities were dispersed, they would still be faced with the necessity of remaining in constant touch with the center of the city, and as a result the variable flow of traffic between the outlying regions and the center would only become larger. Again, it would be perfectly all right, as had been suggested, to move the government to the foot of Mt. Fuji, which, given a high-speed highway, would be separated from the city by only an hour's drive. On the other hand, if it remained necessary to spend two or three hours to come from the city limits to the center of town, it is doubtful that proper communication could be maintained. Here again it is clear that the problem is Tokyo itself. In any event, the removal of the government would not necessarily curb the development of the city itself. Certainly the fact that the American government is in Washington has not prevented an explosive expansion in New York.

13. We are not opposed to the measures mentioned above, but we are opposed to any argument which holds that they are sufficient solutions to Tokyo's problems. Several desirable changes are:

a. The construction of metropolitan subcenters.

b. A conversion to high-rise buildings near the central district and a corresponding shortening of commuter lines.

c. The construction of high-speed thoroughfares and the expansion of the subway system.

14. FROM A RADIAL STRUCTURE TO A LINEAR STRUCTURE In the society with an open organization and in the pivotal city of this organization the mobility involved in free individual communication is assuming a larger and larger scale. This movement, added to the fixed movement of regular commuters, has led to extreme confusion in the larger cities. The urban system developed in the middle ages cannot withstand this movement, and the centripetal pattern is seeking to reform itself from within.

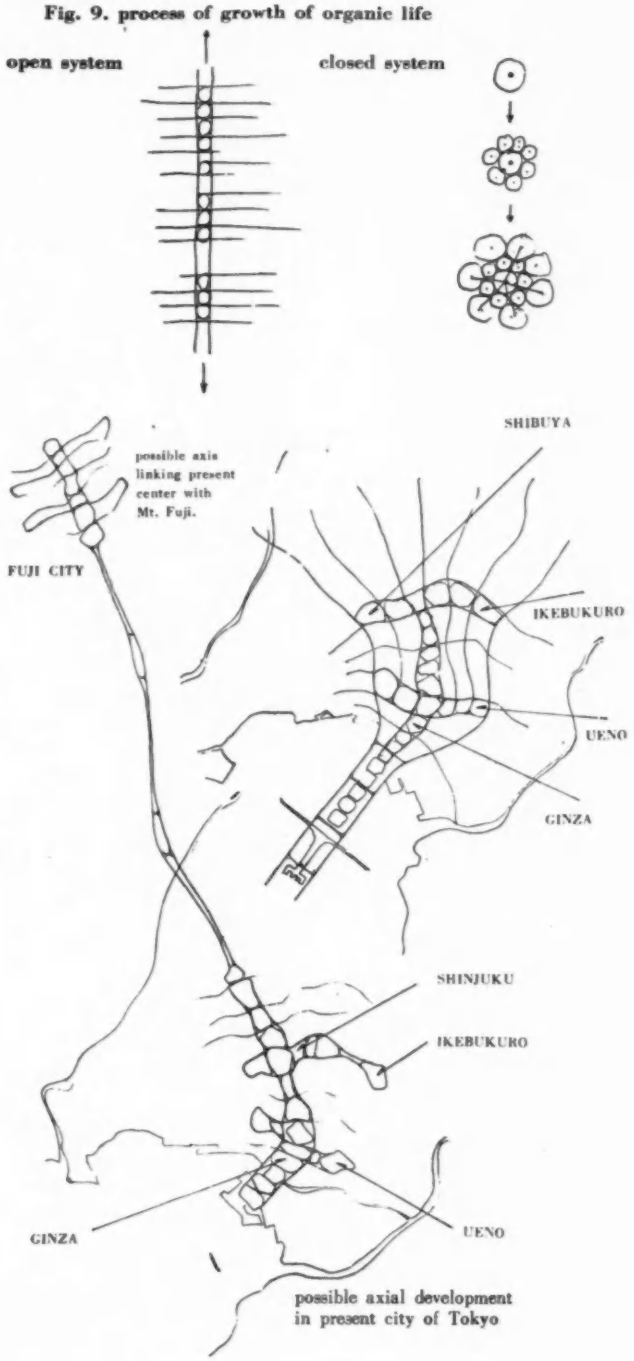
15. We reject the concept of the metropolitan civic center in favor of a new concept which we call the civic axis. This is tantamount to rejecting the closed organization of the centripetal pattern in favor of an open organization which makes possible a development along a linear pattern. In effect, we are proposing that the radial structure of Tokyo be replaced by an axis which develops linearly.

16. A Proposal for Cyclical Transportation. It is estimated that the Tokyo of twenty years hence will have a population of 15,000,000. This will probably mean that 2,000,000 or 2,500,000 people will have to gather along the civic axis in order to perform necessary urban functions. In addition it may be expected that five or six million people will flow into the axis each day. While many of these people will rely on mass transportation, there will also be flowing mobility of individual traffic. The present system of streets and ordinary highways could never withstand the strain of such a volume.

17. With the existing system of highways, at the points of interchange it is unfeasible to have more than three lanes in one direction. The three-level cyclical system that we propose, however, overcomes this limitation with a series of overlapping links. In each link all traffic is one-way, but in any two neighboring links the direction of circulation is opposite, so that at the points where the links overlap, movement in both links is in the same direction. The overlapping links serve as points of interchange, the connection between upper and lower links being accomplished by means of ramps. The number of ramps is equal to the number of lines, and the ramps alternate with continuing lanes. This type of highway could be made to handle ten times, or even thirty times, as much traffic as the present-day freeways, and a civic axis with a system of cycles of this design could serve as a rapid and effective means of communication for a city of any size. The three levels of traffic would be divided in accordance with the speed of vehicles moving along them, and the lowest level would be a unit of a man-made "ground" which would contain several levels of parking space.

18. The cyclical transportation system supports linear development, and the fact that it is composed of distinct units makes gradual development possible. This system is composed of unit cycles somewhat like the vertebrae in the spine. At each stage of development the system is complete, but it is always possible to add another unit. Cycle transportation is therefore suited to the mobility of an open organization, whereas the centripetal pattern is not.

Fig. 9. process of growth of organic life



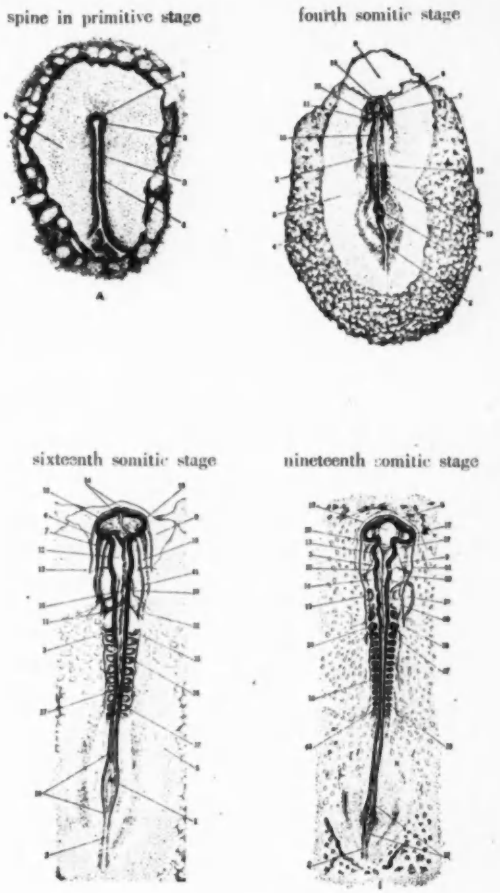


Fig. 7. Traffic volume by public bus

19. Residential Areas. The cyclical transportation system will lead to the development of parallel streets branching out perpendicularly from the axis. These will extend into residential areas. Traffic along the streets branching out for the axis will also be one-way, outgoing vehicles proceeding along one street and incoming vehicles along the next. Each pair of streets will thus form a loop similar in some respects to the links of the central axis. These loops will bring subcenters such as Shinjuku, Shibuya, and Ueno into the system. We consider these subcenters as regional centers of comsumption -- the loci of the tertiary consumption functions. The tertiary production functions will be located along the axis, but the consumption and production functions will be closely linked to them by the axis itself and by the loops extending from it.

20. The streets radiating from the axis will provide communication between residential areas and the central area. This connection is particularly clear in the districts built over the bay. The branch streets on the bay will also be provided with mass transportation which links with the mass transportation on the axis. Within twenty years some 5,000,000 people will probably live on the bay. Some of the residential districts will stand on reclaimed land, and others on platforms supported by piers sunk directly to the ocean bottom.

21. ORGANIC UNIFICATION OF THE CITY, THE TRANSPORTATION SYSTEM, AND ARCHITECTURE. The basic difference between the automobile and mass transportation facilities like the train and streetcar is that the automobile theoretically makes it possible for individuals to move freely from door to door. In other words, the automobile provides not mass, but individual transportation.

22. The appearance of the automobile has led to the division of vehicles and pedestrians, with the result that the relationship between streets and buildings has come to resemble the relationship between railways and buildings. Even though buildings open on a street, it is usually impossible to park cars in front of them. There is need for a new sequence in which the automobile moves from high-speed highways to low-speed highways and then to parking spaces from which the passengers in the automobile can approach buildings. In other words, there is need for a new organization in which the urban system, the traffic system, and the architectural system are organically unified.

23. In response to this problem the architectural pioneers of the early twentieth century developed the pilotis as a means for releasing ground space. Their idea was to create a public space on the ground where the movement necessary to modern society could take place and a quiet private space above ground where men could live and work. The pilotis area would serve as a link between the two types of space, and automo-

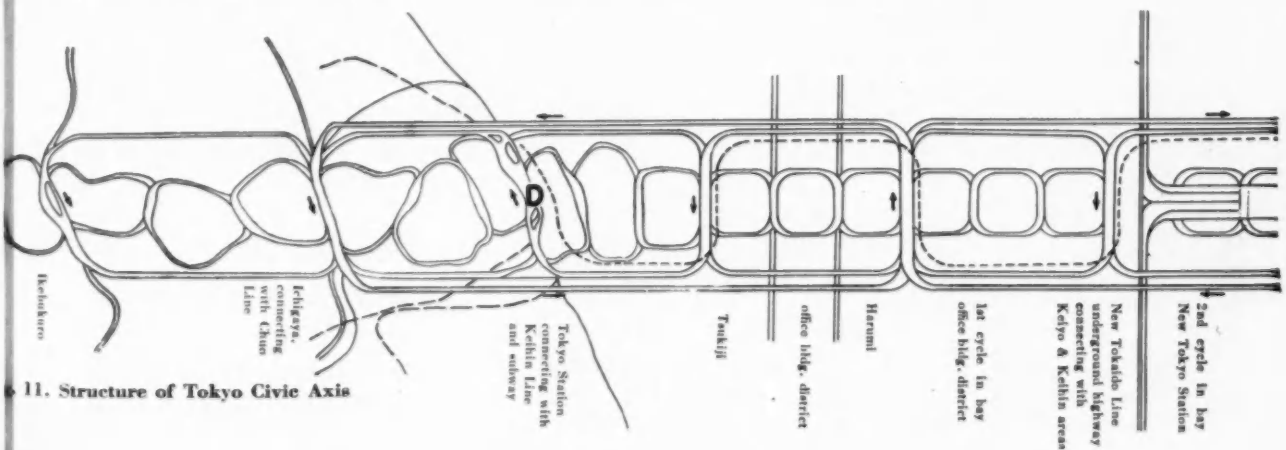
mobiles would move about on the ground without disturbing life within the private space above.

24. In our plan for Tokyo, we have devised means of unifying the core system and the pilotis. As we envision them, the cores of buildings take the place of columns, creating "columnless" pilotis areas under the buildings. This system is unified with the cyclical transportation we propose. Each link of the transportation system contains a unit of area with multi-level parking space. People would enter the parking space in their cars, get out of the vehicles, and then ride up into buildings in elevators situated in vertical cores. In this way the unit urban area and the highway system would intermesh, and there would be spatial order as well as a speed hierarchy linking, first, streets, interchanges, parking spaces, and buildings and, second, high speed, low speed, human speed, and immobility. Urban space would be restored to life.

25. The cores would contain elevators, ducts, and the other installations needed to provide for the movement of men and energy. At the same time they would serve as columns. Between these, buildings with seismic walls would be suspended as needed. The walls as a whole form trusses, and office buildings or hotels would rest on horizontal slabs supported by trusses on both sides. The height of the cores would be from 150 meters to 250 meters, the height of the open space under the buildings about 40 meters, and the length of the span about 200 meters. The structures would therefore have a scale and a spatial arrangement which would be compatible with the variable flow of automobiles on the ground. The cores would serve not only as supports for the buildings, but as the arteries of traffic. The type of architecture may be thought of as a development to urban scale of the pilotis and core arrangements that our team has experimented with in the past.

26. THE RESTORATION OF SPATIAL ORDER IN THE CITY. It is necessary, while organizing the city in such a way as to give order to the various levels of urban space -- from private to public -- to arrange these spaces in a clear pattern within the urban structure. When it comes to the question of residential areas, there is a need to construct a comprehensive dynamic whole in which there is an order of progression from the house to the playground for children to the space of quiet gatherings to large open spaces to large-scale recreation and sport centers; from the kindergarten to the primary school to the middle school to other educational and social installations; and from parking to transportation plazas to highways. The measurements of these various elements must be arranged into an organic whole which meshes well with private houses and which provides for low, for continuity, for expansion, and for contraction. In our plan, the residential areas that stand on man-made platforms in the bay are characterized by a vertical distribution of these

Fig. 10. Section of interchange



11. Structure of Tokyo Civic Axis

various spaces, but the areas that stand on reclaimed land are for the most part characterized by a horizontal distribution.

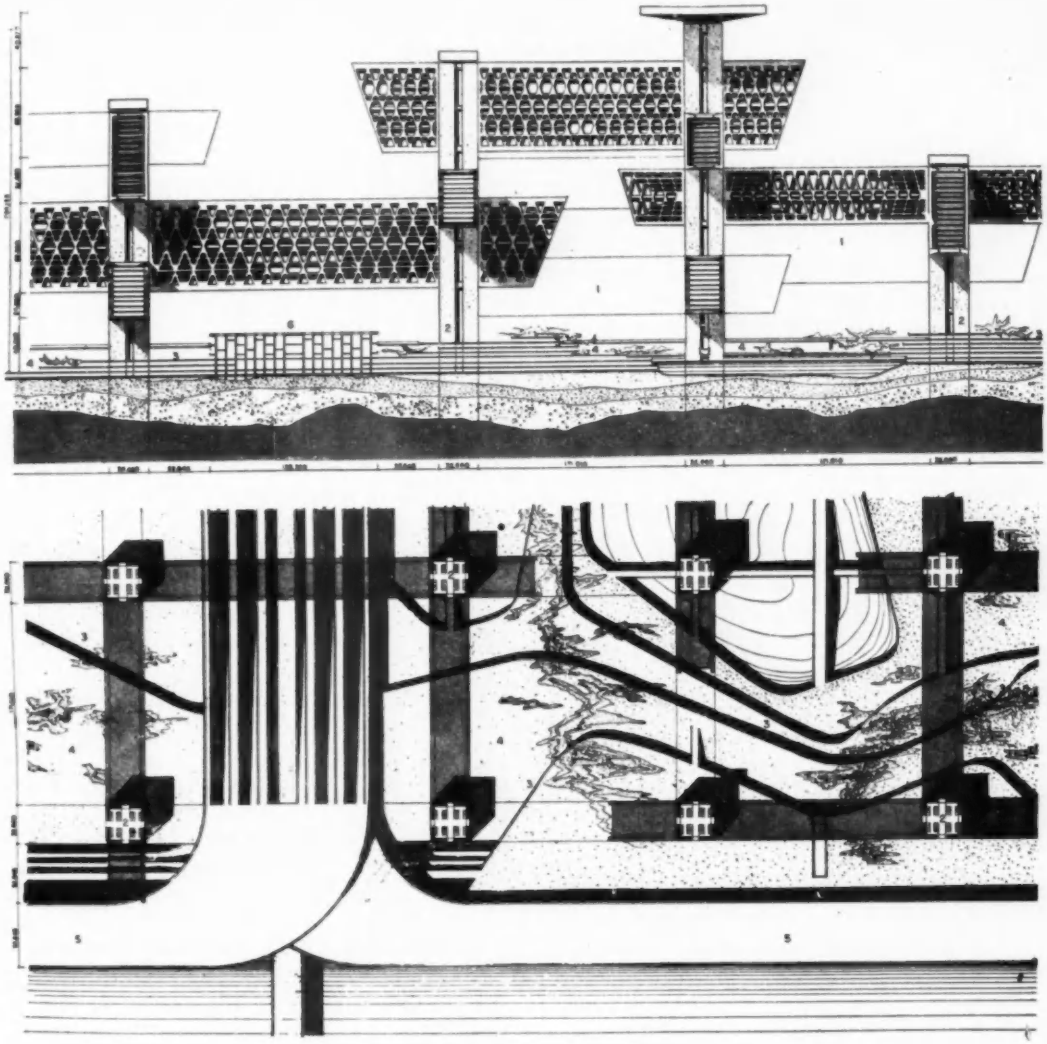
27. Sites for residential areas will be created by two methods: the creation of man-made platforms above the sea, and the reclamation of land. A part of the land for residential areas will be obtained by sand-pump reclamation of the sort now employed in most reclamation projects. At the same time in the places where the removal of sand has caused the sea bottom to become thinner, concrete foundations will be laid on the hard subterranean level, and large man-made platforms will be raised above these. If these two methods are used in conjunction with each other, there will be no need to transport large quantities of earth from other areas.

28. In building over under-sea foundations, it will be more logical to use structures of large span, in which the foundation supports are concentrated. Over these supports, a variety of man-made platforms could be considered. In our plan, the structures built here are more or less triangular in section. At every third level they have concrete platforms extending from side to side and housing gas, water, and electricity lines. On these platforms it would be possible for each individual to construct a house to his own taste from the available manufactured building materials. There would be one row of houses near the top of the structure, but two or three on the lower levels where the structure spreads out.

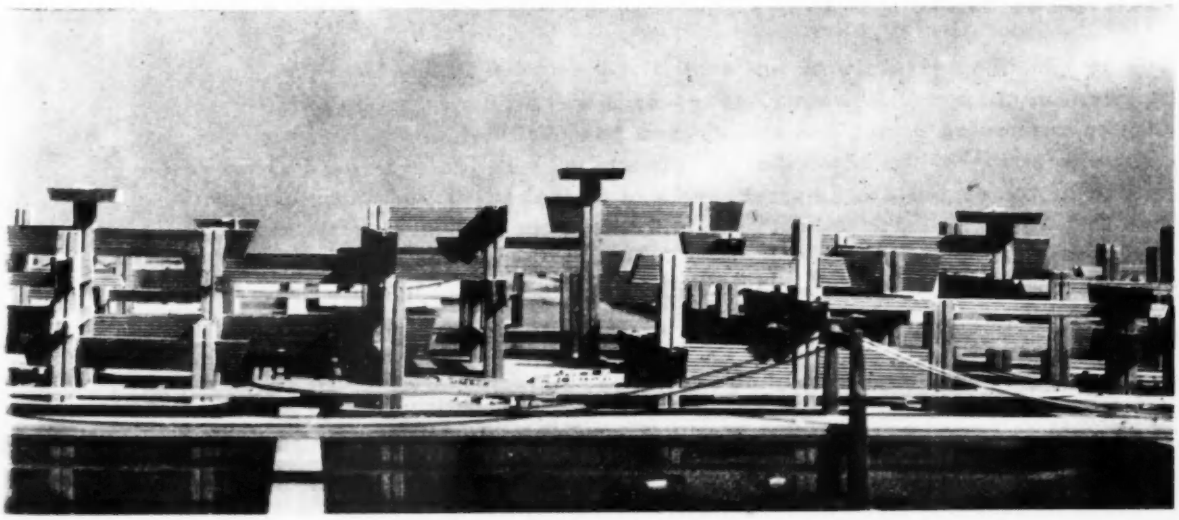
29. PROGRAM FOR CONSTRUCTION. In the first five-year plan, three cycles would be constructed. These would link Ichigaya and downtown Tokyo, downtown Tokyo and Tsukiji, and Tsukiji and Harumi. Interchanges would be constructed over the moat at Ichigaya and at the control area in Tokyo Station thus linking the cycle system with the present transportation system in the metropolitan center. Without this connection, the proposed civic axis would not develop. The cost of constructing a single unit link in the new system would be ¥ 300,000,000,000, so that the cost of tnree links would be ¥ 900,000,000,000 (approximately $2,500,000,000).

30. Since the new highways would in effect be suspension bridges running 40 meters above ground, construction would be possible if sufficient land were acquired for piers at intervals of one kilometer. In the Tsukiji-Harumi link, however, it would be best to begin with the idea of carrying out a complete redevelopment of the enclosed area, and for that reason, the entire area should be bought up. Allowing ¥ 600,000,000,000 for various purchases of land, the cost of the three links from Ichigaya to Harumi would be ¥ 1,500,000,000,000 ($4,016,000,000).

31. On the other hand, the construction would lead to the creation of three one-kilometer links in the Tsukiji-Harumi interval. These would contain an area of about 3,000,000 square meters, which if sold for ¥500,000 per square meter, would yield the required ¥1,500,000,000,000.



1. office space 2. vertical shaft core 3. parking floors 4. plaza 5. highway 6. interchange



Abstracted from Zodiac 7,
pp. 140-150.

THE FACE OF THE CITY - A CONCISE GRAMMAR

1. The search for a means of analyzing the visual city is being undertaken in many different ways, Kevin Lynch's view, reviews in EKISTICS 11:65, 207-210, names several different elements. Einrich Erdsiek had concerned himself with only one of these, the street. The street, as identified by Erdsiek, by which he means the "rue corridor", or street lived with buildings. He takes no account of such new possibilities as the street becoming structure: e.g., the project for Boston Bay (EKISTICS 11:68, 469-476) and Tokyo (preceding article). Even so, his dicta are still valid for at some stage all planning must reach the human scale.

2. In Erdisek's view the whole problem of town planning may be summed up in two questions:

   a. How can we give a section of a street the appearance of unity?

   b. What appearance shall we give to a transitional zone between one section and another?

3. The structure of a section would consist of three elements:

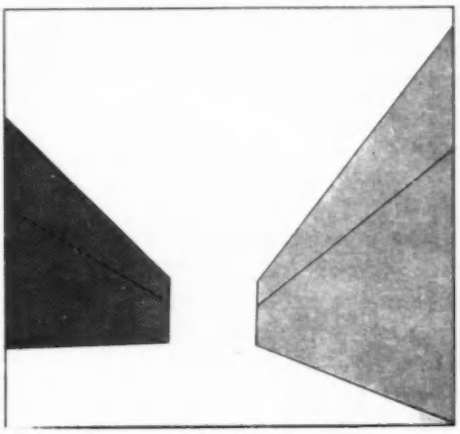
   a. the entrance to the zone formed by the section in question;

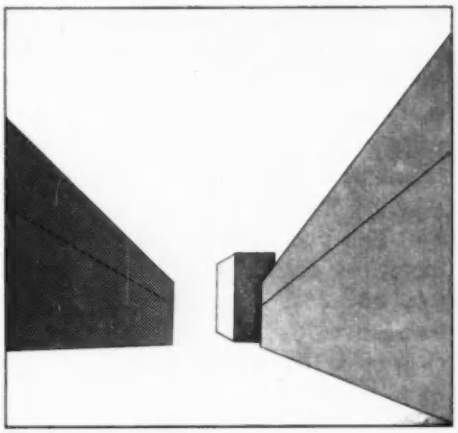
   b. the marking off of the zone;

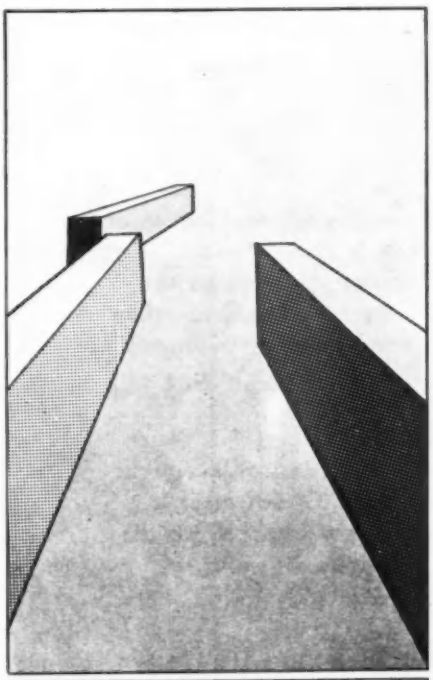
   c. the end of the section, which will also be the transition from one zone to the next.

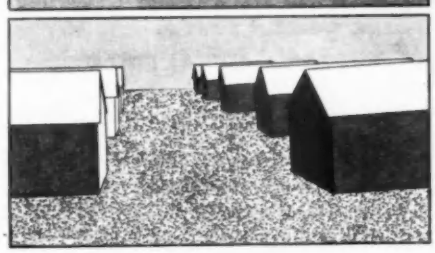
Between these structural elements there are very specific correlations which can be determined in designs.

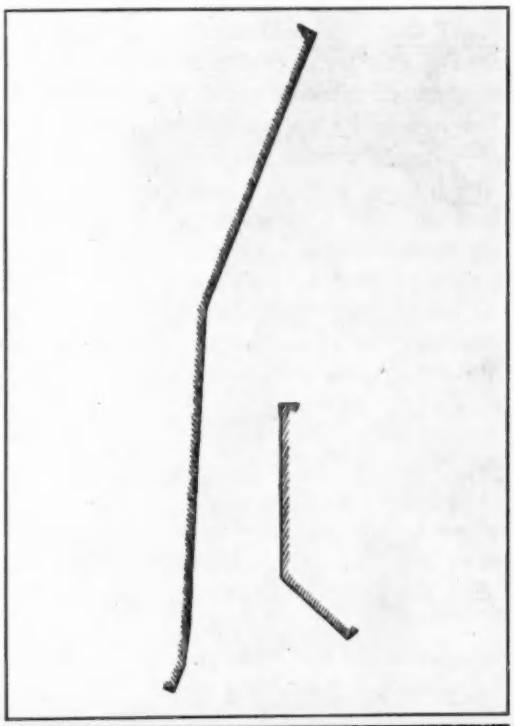
4. Fig. 1: We certainly do not feel like going along this street. The impression changes, however, (Fig. 2) if we give the street a dominant point to concentrate on: the street then has a direction. Thanks to the oblique position of the blocks of construction, one feels directed towards the end of the street and beyond: we are prepared to see something important. Fig. 3: Even without a dominant point on which to fix one's gaze, one can attain a similar and, one might almost say, magical effect through the arrangement of buildings. Fig. 4: Here we see the buildings arranged transversally with respect to the street axis, giving a monotonous appearance to the whole; the entrance to the quarter too, is lifeless and seems to lead nowhere. The constructions or rows

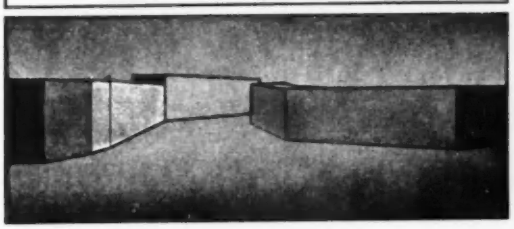












of constructions belonging to the same section should, therefore, be correlated with one another not from the point of view of the picturesque, but from the much more concrete and precise viewpoint of space. We cannot expect to achieve urban effects if the rows of buildings making up a section of a street let the eye wander, or if the dominant point on which the eye fixes has been situated haphazardly.

5. The position of the point on which one's gaze concentrates can be given by the small plazas in front of the constructions (fig. 7a, 9, 19, 22, 23, 25). The form to be given to the entrance is as important as that to be given to the exit. It must be clearly recognizable that this is a beginning (see fig. 5, 6, 8, 9, 10, 13, 14, 20, 23). Rows of buildings belonging to the same section should always move in relation to one another, as if both were making the same gesture. In this way they will take on a form marked by harmony and expressive movement. Planning rows of buildings, in fact, is an art. How should they be planned? There are two important and critical moments in planning, and in many cases there are even three.

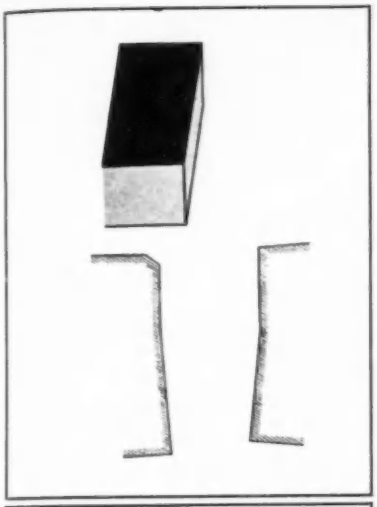
6. First, the entrance to a section of a street seen from the opposite direction determines in turn the exit, and must therefore also show a dominant point on which to fix one's gaze. The double dominant required as a result of the two directions is effected by the row of constructions (see fig. 15, 21, 22).

7. Secondly, in town-planning we have a continual contrast between vertical and horizontal, that is between that which rises from depth and that which is in depth. The horizontal lines which oppose the vertical increase this optic effect. What matters is to balance this contrast of coordinates and their opposite tendencies of movement. This balance should be applied in planning the rows of buildings (fig. 11, 19, 20, 23, 24).

8. Finally, another element may influence the planning of a row of buildings, and that is when the section of the street is not only a zone from the entrance to the exit, but constitutes a central point; that is, when the tendency to go through the street is in polarity with the tendency to remain there (see fig. 10, 11, 17).

9. To sum up: the rows of buildings and their facades will always be directed towards a dominant and characteristic point situated where the visual zone terminates or possibly towards a central point where the greater space suggests a pause.

10. And now we shall answer the second question regarding the appearance to give to the transitional points between the various sections, (fig. 18 to 26). We immediately discover the principle of balance given to the contrast between the vertical and horizontal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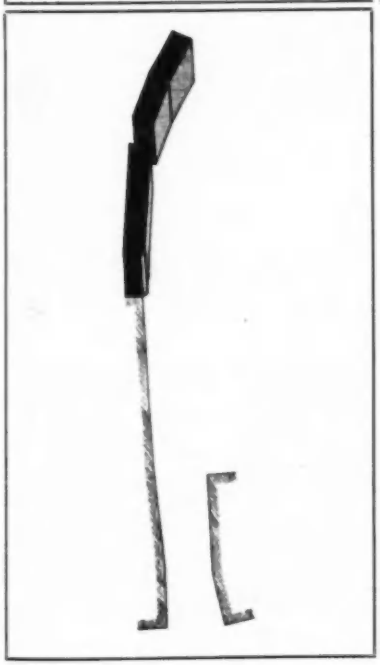
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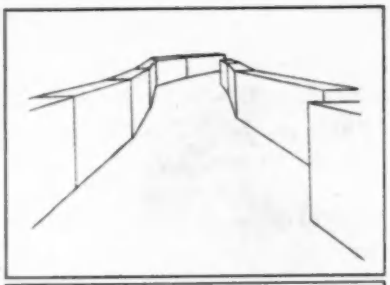
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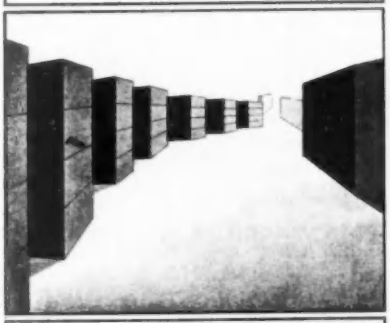
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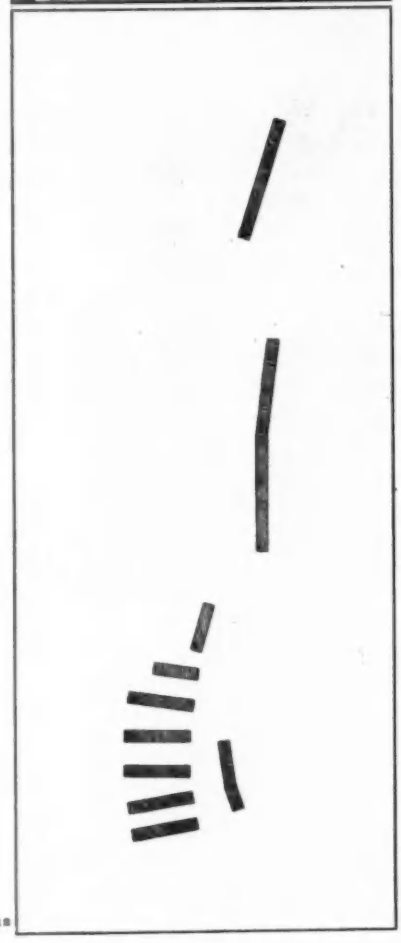
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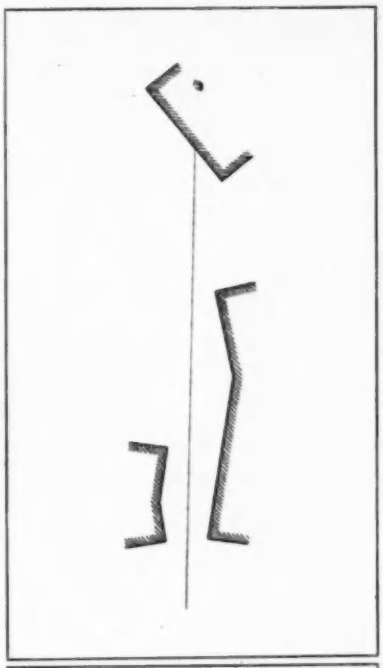
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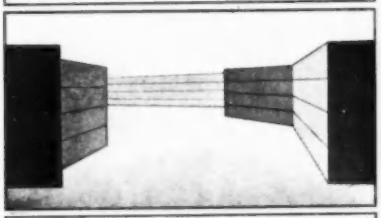
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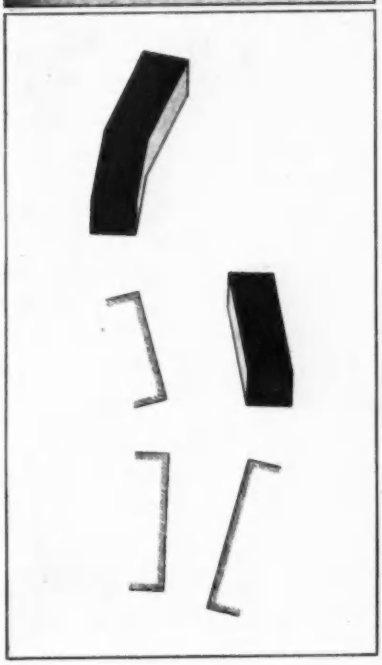
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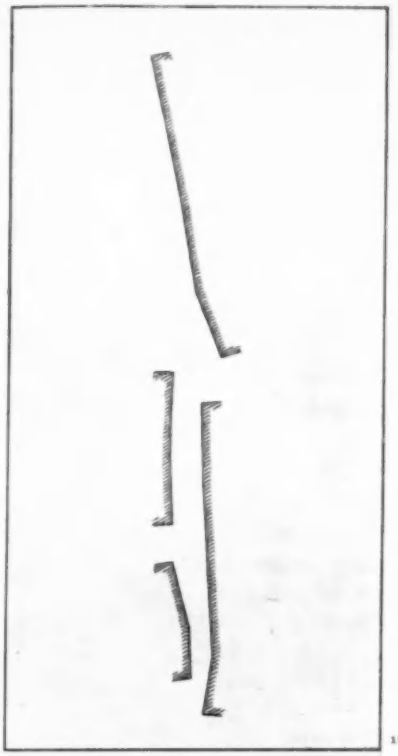
coordinates. In this play of contrasts we see something like a man's step: from the right leg to the left and then once again to the right. An analogous rhythm appears also in the sequence of the various sections. When a wall seems to turn, it leads at the same time in depth and, therefore, towards the following section.

11. Another word about the illustrations. Fig. 4 contrasts with figs. 5, 6, 13, and 14: a classical approach to the end of a street. Comparing the plan with the perspective we observe that the eye takes in everything which is at a distance, and that a long street may look short and limited. Figs. 7 and 8: alternatives between the dominant point and the arrangement of rows of constructions before reaching the dominant point. Fig. 10: a decided entrance; to the left a row of constructions on a winding line with the precise introduction of a dominant point in the complex, as in Fig. 9, Fig. 11: a like picture, but with buildings placed transversally with respect to the end of the street.

12. Figs. 15 and 16: the structure of a street with few constructions rising to form a wall delimiting the end. Fig. 17: in the foreground to the right and somewhat back on the left side, small squares arranged in relation to a centre of gravity; lastly, the right foreground forming an uninterrupted line. Fig. 20: A view showing the same structure. The two parallel fronts which mirror each other prevent any kind of artistic appearance. Fig. 21: Here one's gage is drawn to a dominant construction. Fig. 22: The same square seen from the opposite direction. Fig. 23: One moves on to the following section. Fig. 24: Here we have two sections and two dominant points. The first dominant point is formed by an imposing front which fits harmoniously into the outline of the street. As a contrast to this we have the wall forming the background of the second section. Fig. 24: The same, seen in plan. Fig. 26: a variant of figure 25. In all these examples we find forces which draw one along a street, induce one to pause, and harmoniously lead us on.

13. In the modern city we can go without a great many artistic details, but not without the effects produced by space. Depending on how rows of buildings are planned and how zones open and close, like theatrical sets, we shall have endless possibilities for applying the town-planning of our time.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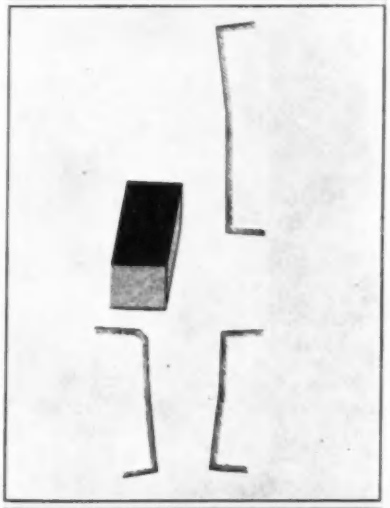
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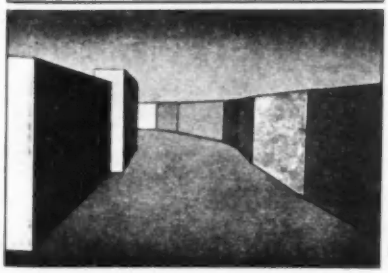
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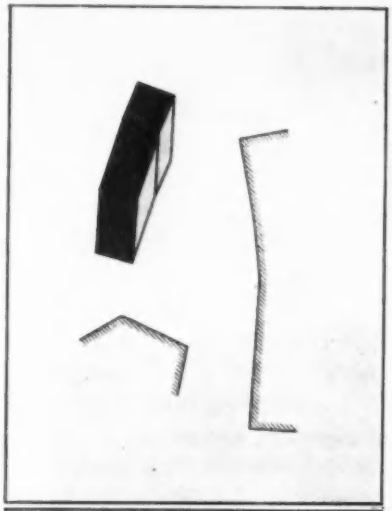
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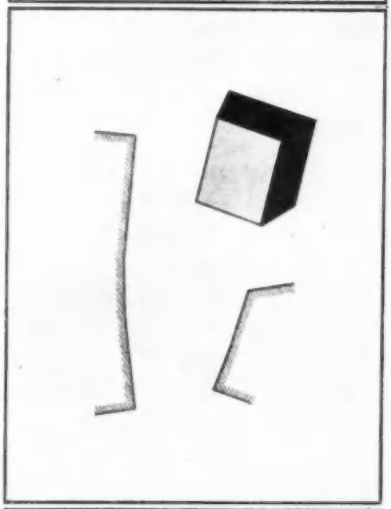
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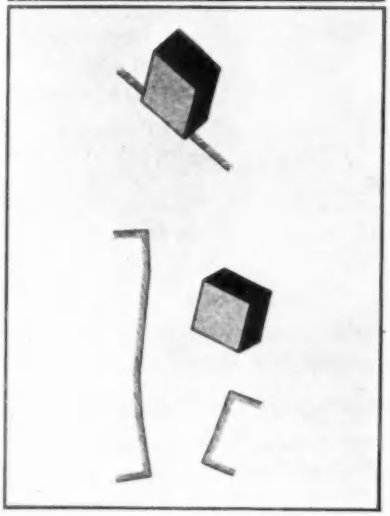
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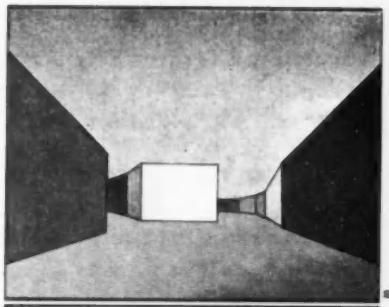
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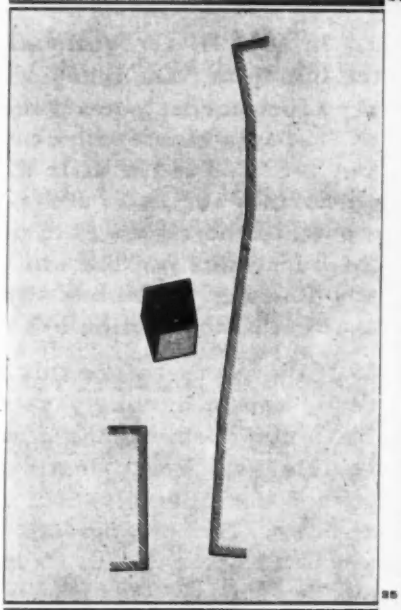
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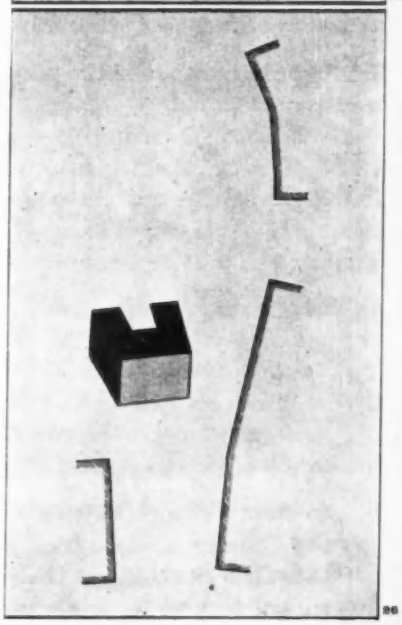
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Abstracted from "The Architects' Journal", January 5, 1961.
Volume 133, Number 3429.
Pages 18-19

MOVING PAVEMENTS

Anthony Goss

1. In 1898 H. G. Wells wrote of the transport system of the city of the future in "The Sleeper Awakes": "This roadway was three hundred feet across, and it moved . . . an endless flow rushing along as fast as a nineteenth century express train . . . Upon it were seats, and here and there little kiosks. . . From this nearest and swiftest platform a series of others descended to the centre of the space. Each moved to the right, each perceptibly slower than the one above it, but the difference in pace was small enough to permit anyone to step from any platform to the one adjacent, and so walk uninterruptedly from the swiftest to the motionless middle way".

2. Five years before this forecast was made, in 1893, there had already been a moving pavement in action -- at the Chicago World Fair. But a new form of magic carpet -- the mechanically propelled road vehicle, which was continually under-estimated by H. G. Wells, pushed the moving pavement out of the picture for more than half a century. Now the moving pavement seems to be coming back, not yet as a universal cure - all to the problems of transport in a busy city but certainly as a possible way to alleviate some of the more acute problems of urban indigestion.

3. "Speedramps" have been in operation since 1952 in situations where inclines of 13-15 degrees are required. An installation at Wrigley Field, a stadium in Chicago, is perhaps the most impressive. It consists of four moving belts, each 5 ft. 6 in. wide conveying passengers from ground level to the grandstand and another four 3 ft. 6 in. moving belts conveying spectators from the grandstand to the upper deck. The total length of travel is 383 feet and the total rise is 56 feet.

4. The industrial-conveyor principles for passengers have been incorporated in the "Glide Rides" system. At the new airport at Dallas Texas, a system of moving belts carries passengers both ways along three "fingers" from the terminal building to the aircraft. This is the largest passenger conveyor system in existence with 1,435 feet of moving walkways, used by about 14,500 people per day.

5. In September 1960, a "Travolator" was opened at the Bank Underground Station in London, linking the City Line to the railway running to Waterloo Station on the South bank of the Thames. Here the moving pavement forms a long ramp with a gradient of one in seven for a distance of almost 300 feet. It travels at 180 feet a minute, about 2 miles an hour, and it is possible to walk at 2 miles an hour. This has to be compared with the series of slopes and flights of steps which City workers had formerly to struggle up and down, packed like sardines, in the tunnel which they dubbed "the drain".

6. What of the future ? The prize--winning traffic scheme of W. K. Smigielski's in the recent "New Ways for London" Competition envisaged a two--level pedestrian way, the upper level covered and with a moving pavement to speed up walking, leading to a new Soho entertainment centre in the form of a two--level piazza. Moving pavements are to be incorporated in the traffic plan for Moscow. The engineers concerned in the construction of the Travolator consider it perfectly feasible technically to place moving pavements side-by-side at different speeds so that it is possible to start on the slow one, change on to faster ones and then back to the slower one to get off at one's destination.

7. There is no doubt that moving pavements will be expensive to install. However, they could help to eliminate the need for passenger transport vehicles in central areas. Moving ramps have obvious advantages over moving stairs in a multi-level shopping area while some of the problems of pedestrian walking distances from car parks to pedestrian precincts and from end of large precincts to the other could be looked at in a different light if moving pavement were available as a possible solution to circulation problems.

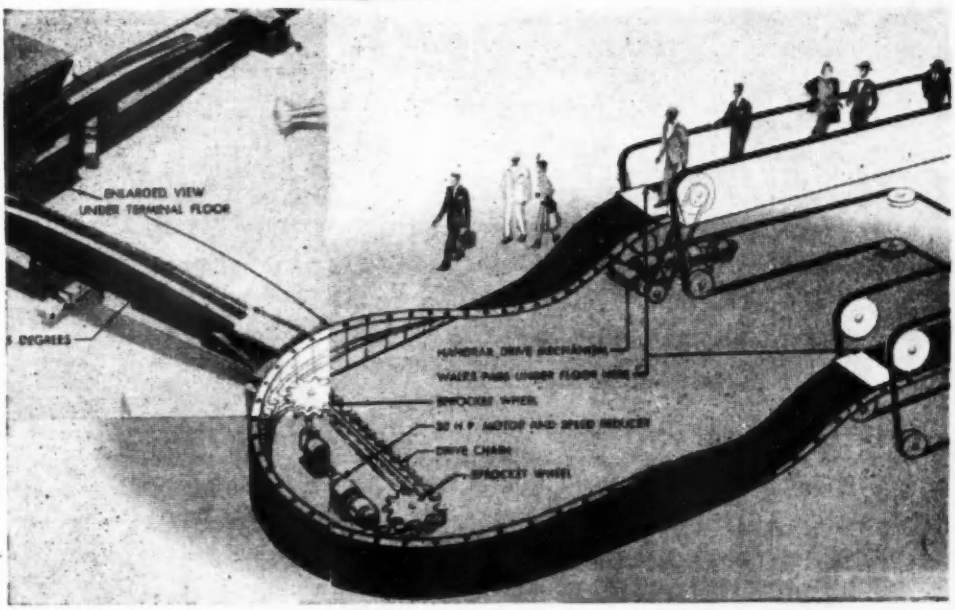
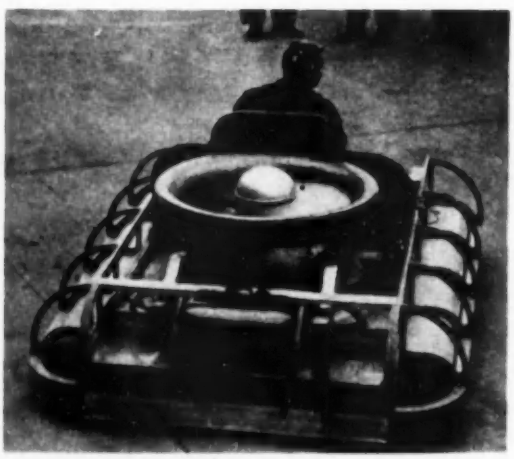


Diagram of Hewitt-Robins's Glide-ride moving pavements at Dallas Airport

Abstracted from "Industrial
Design" January 1961.
Volume 8 Number 1. Pages 74-75.

MINIMAL TRANSPORTATION VEHICLES

1. The annual meeting of the American Society of Industrial Designers program included a minimal transportation rally and demonstration by the students of the Institute of Design under the direction of Jay Doblin. While this was considered "fun" some of the vehicles, especially those that demand no prepared surface, have potential use in less developed areas. The vehicle, shown below, has a handsomely styled tank that runs on nothing but air, water, and promises. The tank contains water under a head of compressed air. The air forces a stream of water out the rear, and the vehicle is "jet-propelled."



Abstracted from "The Architects' Journal, Volume 133, Number 3434. February 9, 1961. Pages 211-216.

RADBURN PLANNING: FOREIGN EXAMPLES URBAN APPLICATIONS

Paul Ritter

1. The first articles of Paul Ritter's reassessment of Radburn planning were abstracted in EKISTICS (11:66, 334-342). On the following two pages, three examples are illustrated of current applications of Radburn-type residential layouts. The Eastwick Development by Doxiadis Associates (more completely detailed in EKISTICS 10:55, 195-220) provides an example of this kind of use in a redevelopment area while the two German proposals are applied to new towns - the more traditional place for such layouts.

2. Eastwick Philadelphia. This is a comprehensive redevelopment project sponsored by the Reynolds Metal Company. About 7,500 people are to be rehoused at a density of 23 dwellings per acre with over 100 per cent garage provision. The consultants for the scheme, Doxiadis Associates, propose a pedestrian foot path system down the long axis of the site. The houses face on to the roads in many instances, but each has a direct access to the footpath system. Local regulations limit culs-de-sac to 500 ft. and the consultants have reluctantly put forward an alternative and less satisfactory scheme in which loops are used instead.

3. Cologne. The city of Cologne has begun the construction of a new town of 100,000 inhabitants with neighbourhood units for between 4,000 and 9,000 persons each, built to a gross density of 55 persons or 15 dwellings to the acre with 50 per cent garage provision. Each neighbourhood unit (or superblock) has its own pedestrian centre. Though 100 per cent traffic segregation is aimed at, underpasses are only provided at the crossings of major roads. Local shops are badly positioned along the roads and the indirectness of some path routes suggests that short cuts across roads will be taken in preference.

4. Sennestadt. This is a new town of 20,000 inhabitants now under construction near Bielefield to the design of H. B. Reichow. Gross density is nearly 80 persons to the acre, but garage provision is below 50 per cent. Reichow's version of the Radburn idea impliesa road system which spreads from within, like the veins of a leaf. The curves are calculated for different speeds. Also, he has no objection to loops. This means that many footpaths have to cross roads. One original aspect of this scheme is the careful differentiation of road lighting. White light is used in the ring road and at the town center, yellow on main feeder roads and red on minor access roads.

Eastwick, Philadelphia. Scale 1 : 3,000. *Plan of part of the residential area*

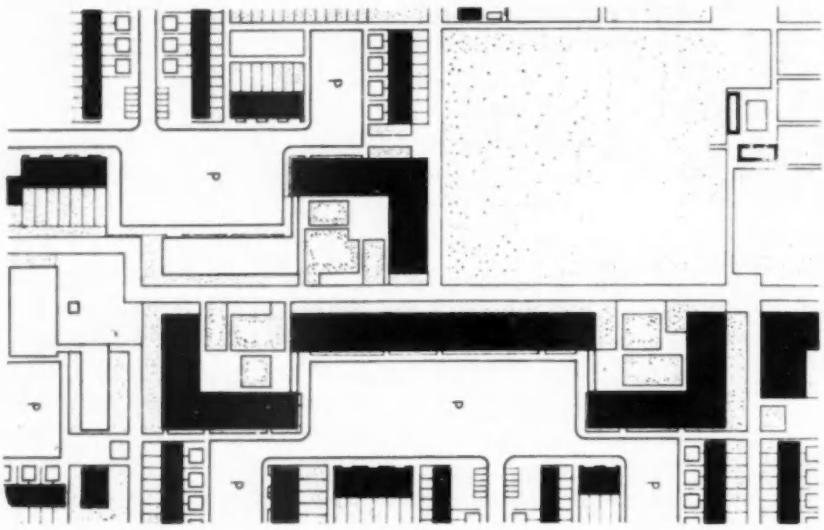


Diagram showing the road system at Sennestadt, near Bielefeld. The black areas are parkways, the circles and squares, schools

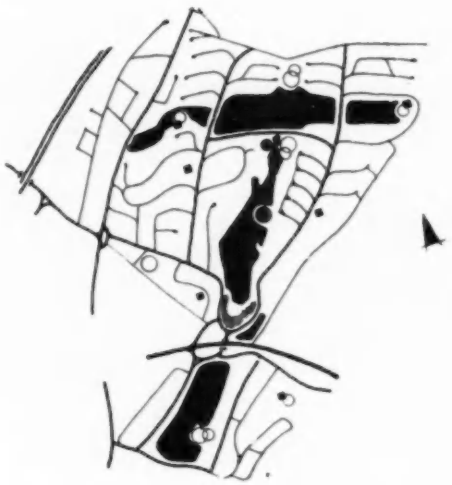
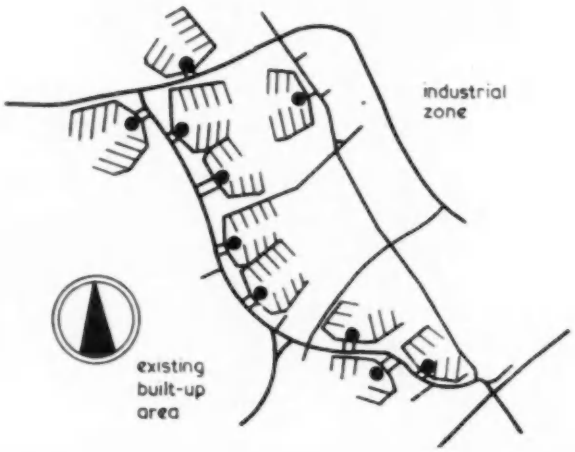
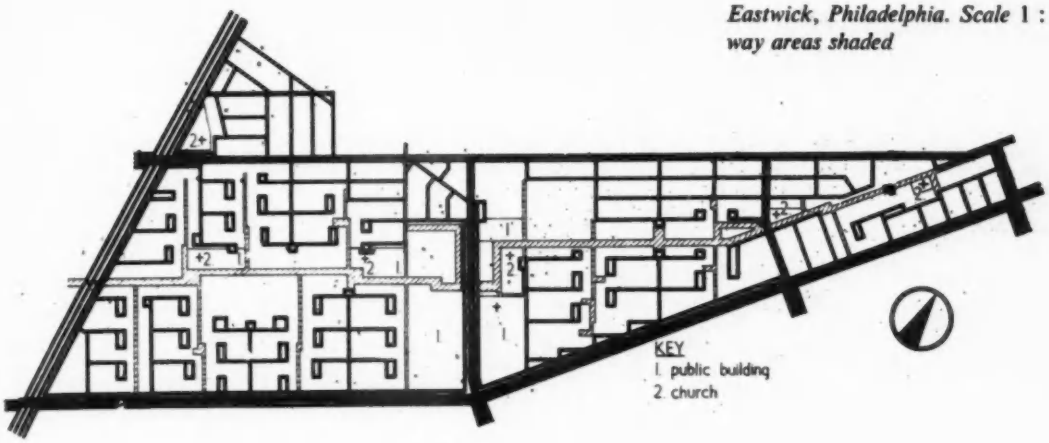
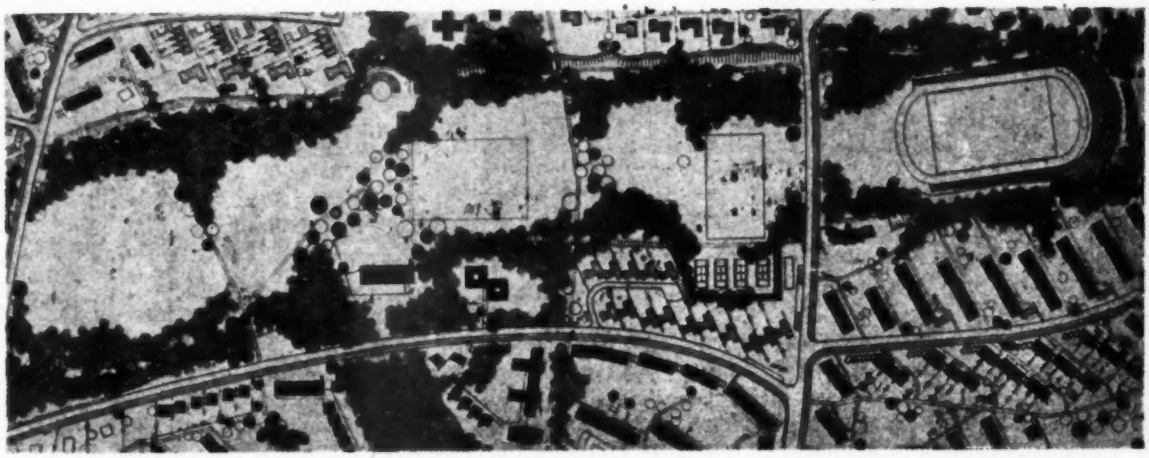


Diagram showing grouping of superblocks and road layout at Cologne new town. The round dots represent shopping centres

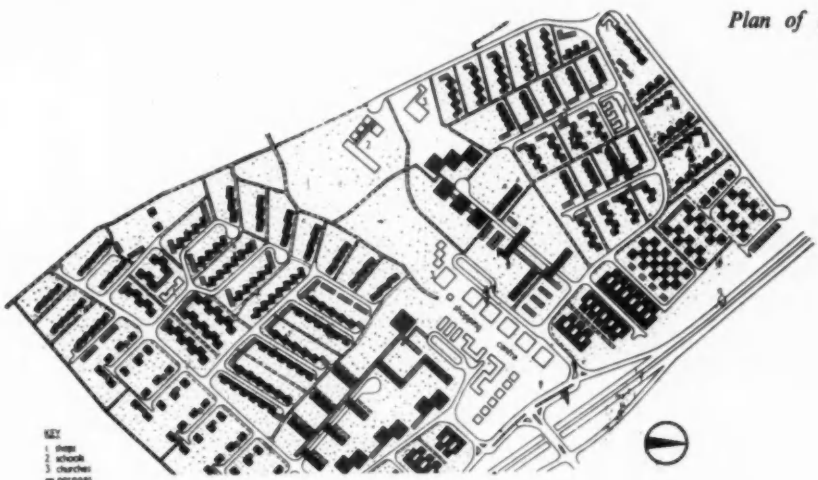




Eastwick, Philadelphia. Scale 1 : 12,000. *Main pathway areas shaded*



Plan of the northern section of Sennestadt. Scale 1 : 6,000



Plan of typical superblock at Cologne new town. Main pathways are shown dotted

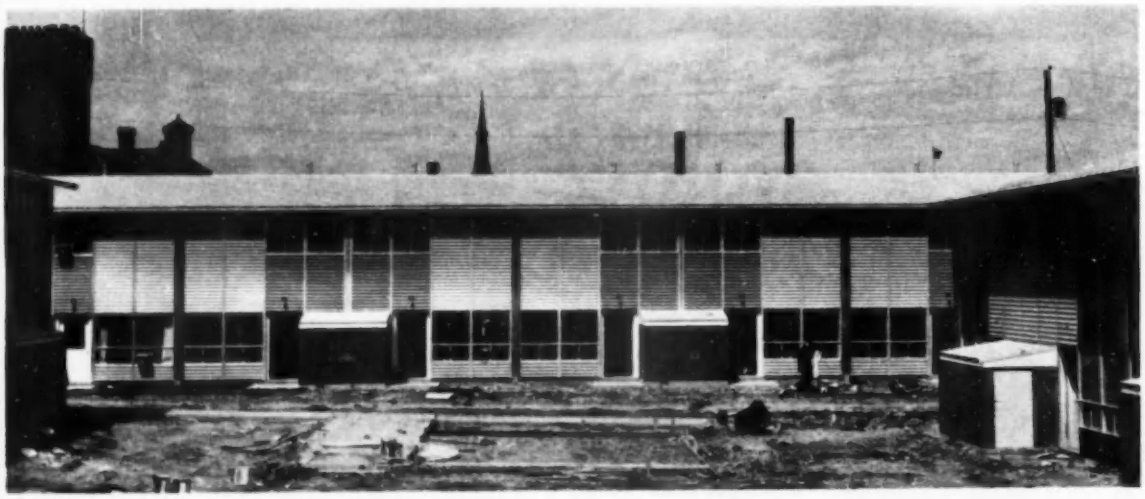
PART STREET COOPERATIVE HOMES, CINCINNATI

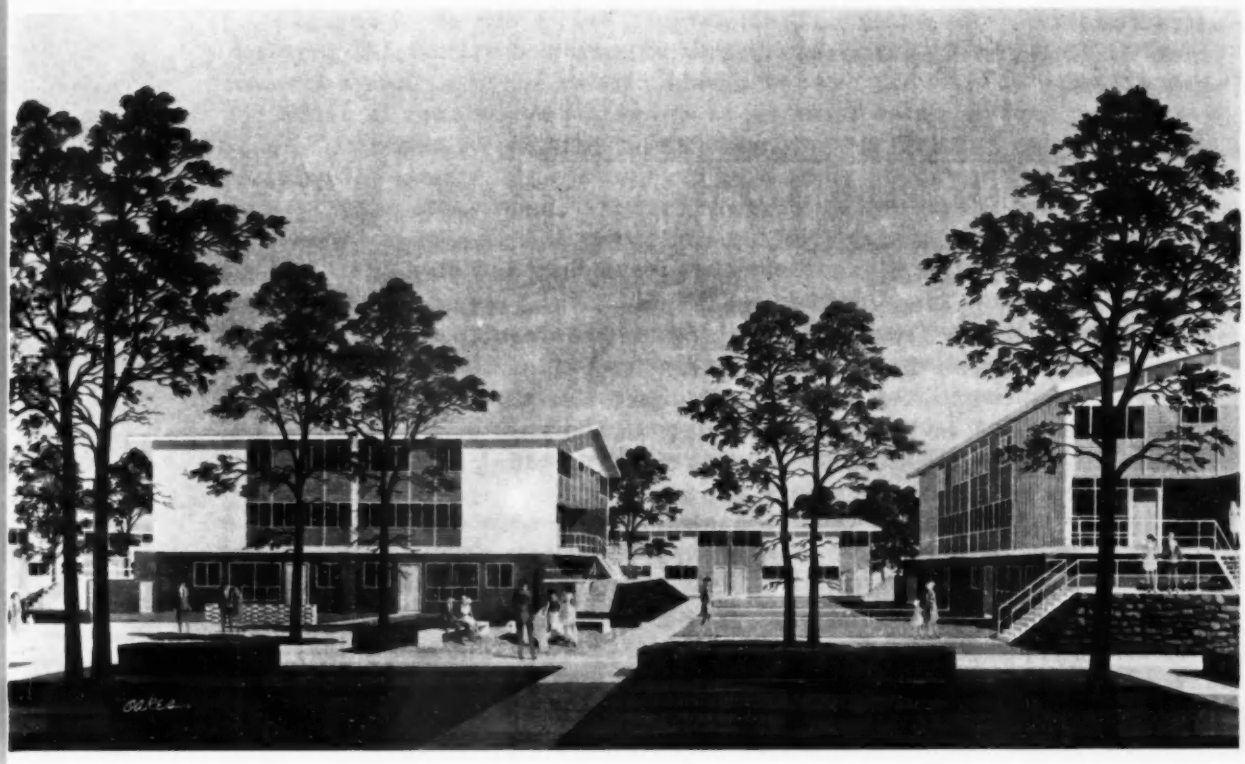
Doxiadis Associates

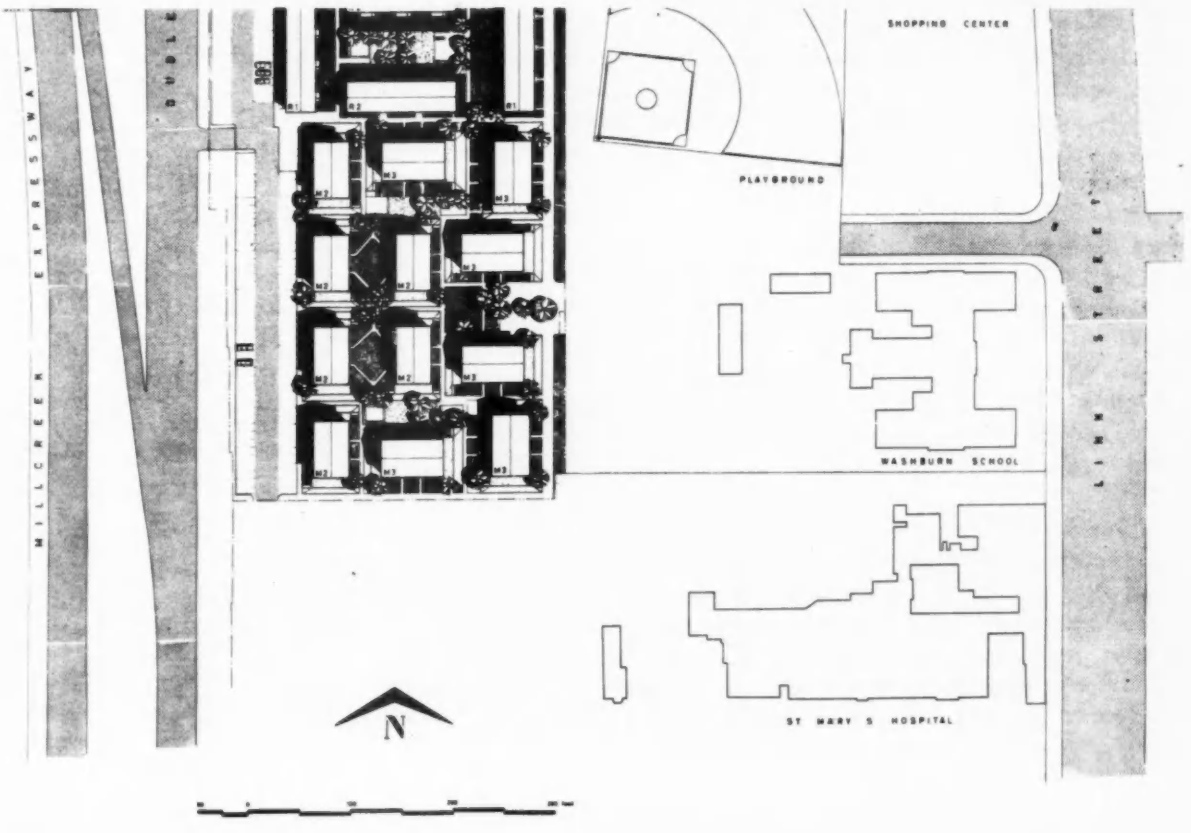
1. The Park Town Cooperative Homes project in Cincinnati, Ohio is the first urban development project to be initiated in that City. Construction on the project began on the 13th of September, 1960 and it is to be completed in 1961. This residential development, a cooperative one, is located close-in to downtown Cincinnati and in only minutes away from the very heart of the city. Its total cost will be just under $4,000,000 and it will comprise 323 dwelling units - 48 efficiency apartments, 48 three-bedroom apartments.

2. The majority of these apartments is incorporated in a new type of maisonette building which will house 8 families in a three level structure and whose unique feature is that each apartment has its own private entrance and garden court. The remaining dwelling units will consist of row-house apartments.

3. Off-street parking for residents and visitors has been provided on the periphery of the project thus permitting free pedestrian movement within the project boundaries to the shopping center, playgrounds and the school existing within the project area. Dwelling units will be offered to the public under a cooperative sales program whereby individuals are encouraged to own rather than rent their apartments. Model homes have already been completed and are open for inspection by the public which is showing great interest in the project because of its close-in location, spacious open areas and the unique features of the maisonette-type buildings.






MILLCREEK EXPRESSWAY
BUBLE
SHOPPING CENTER
PLAYGROUND
WASHBURN SCHOOL
LINN STREET
ST MARY S HOSPITAL
N

Abstracted from "Geographical Review"
Volume LI, Number 1, January, 1961.
Pages 47-70.

THE TWIN CITIES URBANIZED AREA: PAST, PRESENT, FUTURE

John R. Borchert

1. Dr. Borchert, professor of geography at the University of Minnesota, prepared this detailed research paper to describe the pattern of urbanization in the Minneapolis-St. Paul metropolitan area. He based it on the research of Richard Hartshorne published 30 years ago, "The Twin City District: A Unique Form of Urban Landscape", "Georgraphical Review" Vol. 22, 1932, p. 431-442, and goes on to prognosticate future growth.

2. Delineating the Metropolitan Frontier. To measure change in a metropolitan settlement pattern, one must have an index of settlement that can be obtained objectively, will have comparable values at any time, and can be obtained rapidly and easily. These considerations led to an experiment in counting, tabulating and mapping the number of road and street intersections per square mile in an area of some 1300 square miles that embrace metropolitan Minneapolis-St. Paul.

3. The initial count was made on United States Geological Survey topographic maps for the late 1940's and early 1950's. Any junction of two public roads or more was counted as an intersection. Each section on the United States rectangular land survey was considered a square mile. The number of intersections in a given square mile was defined arbitrarily as the number within the section lines plus any on the north and west lines. The same procedure was applied to United States Geological Survey topographic map of the area as surveyed shortly before 1900. Frequency distributions of the two counts were then plotted (Fig. 1). The counts showed identical ranges and closely similar frequency distributions of the various numbers within the range. There are three natural groupings -- one clustered in the closely settled city, one characterizing the open countryside, and a third spanning the transition zone.

4. There is a close relationship between road-intersection density and certain other features of the settlement pattern. The intersection count is a good indicator of road and street mileage (Fig. 2): it is also a good indicator of the number of real-estate parcels per square mile -- in other words, the density of subdivision (Fig. 3). Figure 4 suggests that in areas of single-family houses the intersection count is a fair indicator of dwelling density in the rural and transistional zones and a weak indicator in the densely built city zone.

5. Figures 2, 3, and 4 also suggest that there are some basic morphologic differences between the three road-density classes. Figure 2 reflects a change in the relationship between number of intersections and miles of road above and below about seven intersections per square miles. In other words, the line at which urban "fringe" subdivision is invading the countryside is marked by a basic change in the road pattern. On the other hand, Figure 3 suggests that, on the average, the number of additional land parcels per additional intersection or mile of street is about 25 per cent greater in the densely settled city than in the transition zone. There is a significant change in lot density at the boundary between the closely settled city and the transition zone. Figure 4 suggests an even more marked change in dwelling-unit density. Clearly the percentage of parcels occupied by dwellings units is sharply greater in the high density zone; the percentage of parcels lying idle, awaiting building, is distinctly greater in the transition zone.

6. The transition zone (7 to 80 intersections) was arbitrarily bisected for purposes of this study. The resulting category of 45 to 80 intersections per square mile lies invariably in a very steep gradient zone. Furthermore, the areas it contains have at least 500 subdivision parcels per square mile and may have as many as 500 dwelling units per square mile (Fig. 4). This category lies on the threshold of the 1950 census criterion for urban settlement density in unincorporated places -- 500 dwelling units per square mile. Thus this study uses four categories of road density: urban subdivisions of high density (80 or more intersections per square mile); medium density (45-79); and low density (7-44): and rural areas (fewer than 7).

7. These four road-density classes can be identified and delineated almost by inspection on both the early and recent topographic maps (Fig. 5). It is noteworthy that no types of pattern are present in 1950 which were not also present in 1900.

8. The Land Resource for Expansion. The land surrounding the metropolitan area was categorized in the following four types:

a. Level well drained.

b. Level, poorly drained.

c. Rough.

d. Lake shore.

9. The Pattern of Expansion. Maps A, B, and C illustrate the pattern of high-, medium-, and low-density subdivision in the Minneapolis - St. Paul metropolitan area for about 1900, 1940, and 1956. The maps provide an objective measure of the direction and magnitude of horizontal expansion of urban subdivision over the 56 years and form a synoptic series from which one might hope to analyze

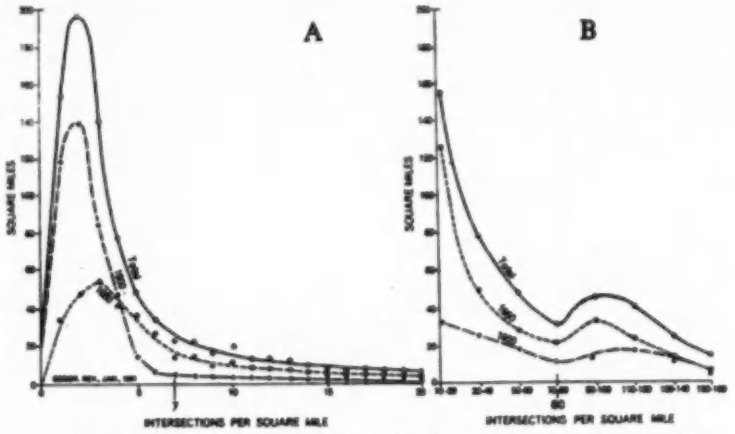


FIG. 1—Frequency distribution of number of street and road intersections per square mile in Minneapolis, St. Paul, and environs.

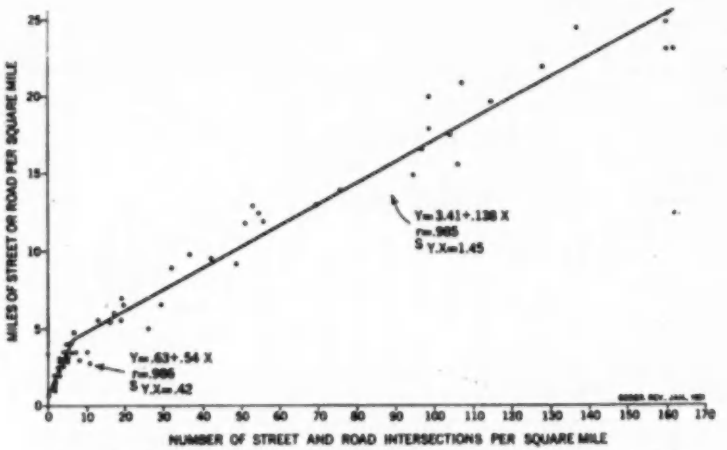


FIG. 2—The relationship between the intersection count and street or road mileage. The points represent a sequential sample of square-mile sections from the metropolitan area.

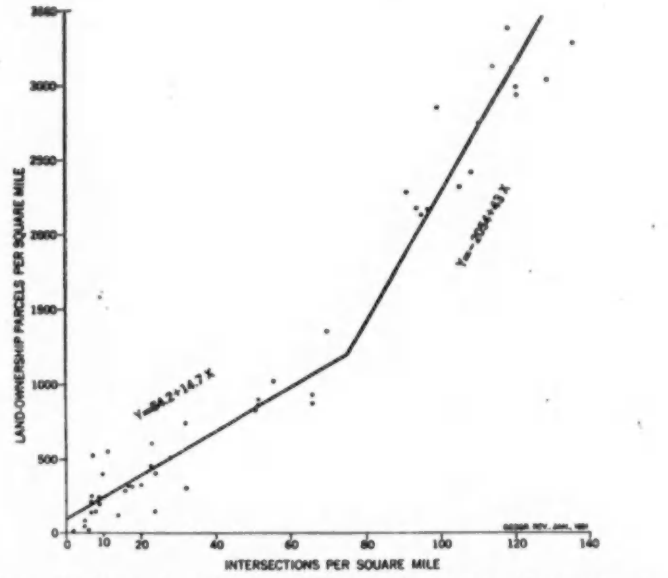


FIG. 3—The relationship between the intersection count and density of land subdivision, or parcellization. The points represent a sequential sample of square-mile sections from the metropolitan area, together with consecutive square miles along an east–west traverse across the metropolitan area through both CBD's.

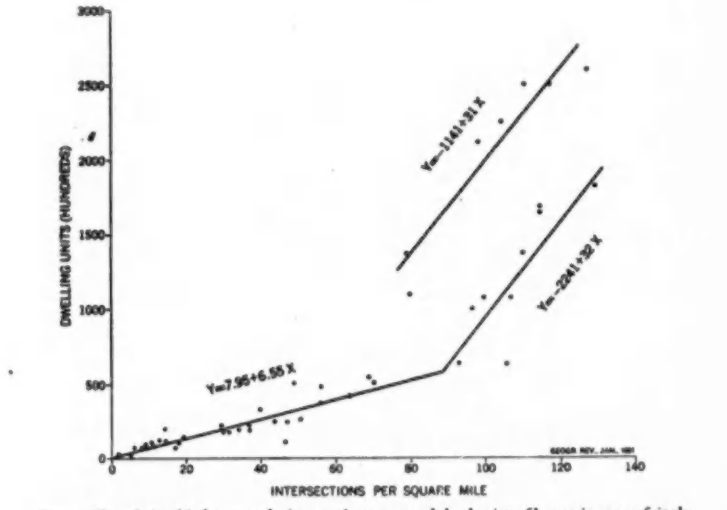


FIG. 4—The relationship between the intersection count and the density of houses in areas of single-family dwellings. The points represent square-mile sections for which data were readily available. Points near the uppermost regression line represent sections that lie within the central cities of Minneapolis and St. Paul.

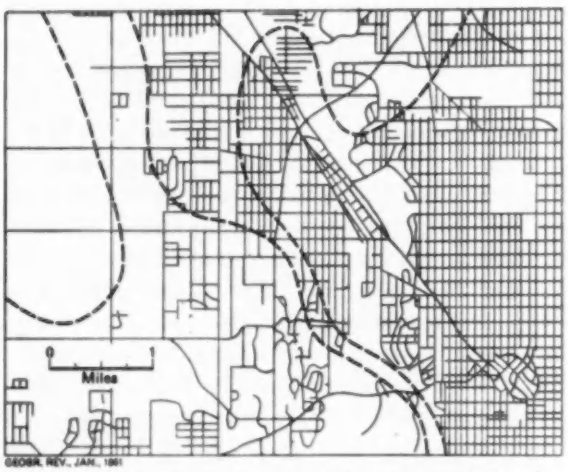
trends, identify principles or generalizations, and perhaps venture a geographic prognosis. Four major points seem to be vividly illustrated by the series.

a. The maps show an enormous horizontal expansion of the whole metropolitan area, the cumulative magnitude of which is shown also by the graph in Figure 10. To add perspective, that graph is carried back to a zero point at 1840, the eve of organized urban settlement in the area, and extrapolated forward to 1980. The graph shows that the average annual net increment in square miles in each category increased sharply about 1940. The change reflects the general loosening of the metropolitan settlement structure that accompanied the sharp post-depression and postwar increase in automobile registrations, the appearance of FHA financing, and the trend toward larger lot sizes. The extrapolition of the curves to 1980 assumes that the upturn about 1940 was the result of unique historical-geographical events, and therefore that the curves will rise at the same rate from 1956 to 1980 as they did from 1940 to 1956.

b. The maps appear to challenge the validity of the term "Explosion" to describe modern metropolitan growth in this region. True, there has been much growth outside the Minneapolis and St. Paul city limits. But this has been largely a continuation of trends that began inside the city limits before 1900. Expansion far beyond the city limits has stemmed from ossification of city boundaries rather than from a new kind of urban growth. The same range of density categories that once occured largely within the central cities characterizes adjoining municipalities now. The fraction of the entire metropolitan settlement in each density class has shown remarkable stability through the years. (Fig. 11). The fraction of the total metropolitan population in the low-density fringe today probably is not much greater than it was in 1900.

c. The maps reveal the irregular shape of the growing metropolis. It has expanded in several massive spokes, with measurable departures from a concentric pattern. The spokes of high density have followed gently rolling or level land. The spokes of lower density have followed lake shores and the major traffic arteries, terrain barriers, and the St. Paul-Minneapolis political boundary. Thus the physical features and persistence of two separate major centers have continued to be important determinants of the growth pattern.

d. Perhaps the most striking feature of the maps is the differential rate of expansion on the Minneapolis and St. Paul sides of



GEOGR. REV., JAN., 1961

Fig. 5—The complete pattern of public streets and roads in an area encompassing the northwest corner of Minneapolis and its adjacent suburban fringe. Heavy dashed lines separate density categories defined in text. The curvilinear streets in the lower right corner were platted in the late nineteenth century; the rectangular grids on the left side of the map were platted in the 1950's. (From a map compiled by the Minnesota Highway Department, 1956.)

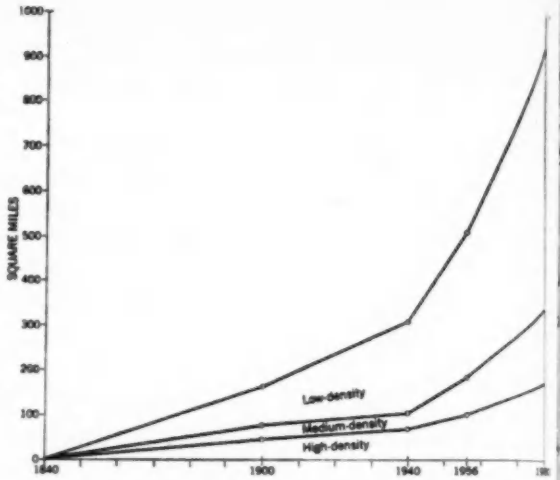


Fig. 10 (above)—Trends in total number of square miles of high-, medium-, and low-density urbanization in the Minneapolis-St. Paul area.

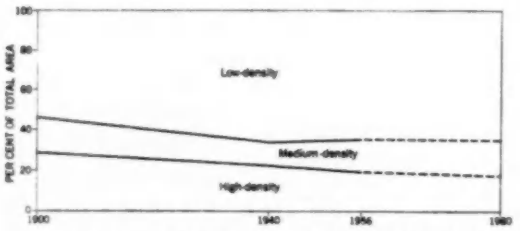


Fig. 11—Percentage of total area (square miles) in each of the three density categories.

TABLE III—TWIN CITIES DWELLING-UNIT INCREMENT, 1956–1980*

DENSITY CLASS	ONE-FAMILY DWELLINGS PER SQ. MI.	ADDITIONAL SQUARE MILES		ADDITIONAL ONE-FAMILY DWELLINGS	
		Map (Pl. I, D)	Graph (Fig. 10)	Map (Pl. I, D)	Graph (Fig. 10)
High	1,700	72	72	122,000	122,000
Medium	560	75	89	42,000	50,000
Low	100	160	253	16,000	25,000
Total increment of single-family dwelling units accommodated by forecast subdivision expansion				180,000	197,000
New dwelling units, Twin Cities Metropolitan Planning Commission adjusted forecast				204,000	204,000
Difference to be accommodated by new multiple dwelling units created on presently used or newly developed parcels				24,000	7,000
Percentage of new dwellings in multiple units, 1956–1980				12	3.5
Approximate percentage of new dwellings in multiples, 1957				10	
Approximate percentage of new dwellings in multiples, 1958				25	

*The average number of one-family dwelling units per square mile was computed from the data on which the graphs in Figures 3, 4, and 6 are based. Data on multiple dwellings for 1957 and 1958 are from the *Monthly Review of the Federal Reserve Bank of Minneapolis*, August, 1959, pp. 2–3.

the metropolitan area. As a result of the faster expansion of Minneapolis, St. Paul's urbanized are no longer constitutes a barrier to development northeastward and southeastward. Thus, Minneapolis growth is probably exterting an increasing force in suburban areas north of St. Paul.

10. Projecting the Pattern of Expansion. The projection was made by first developing a procedure that predicted reasonably well the actual 1940-1956 pattern of expansion, then applying this procedure to produce a prognosis for 1956-1980. The 1900-1940 advance of each density-class boundary was extrapolated to 1956 with the following assumptions and procedures. First, it was assumed that expansion within any time period would proceed at right angles to the density boundary at the beginning of that period. Vectors were drawn from the 1900 boundary to the 1940 boundary at the same intervals according to the formula b = aK, where a and b are the vectors and K is the constant.

11. The constant, K, equals $\sqrt{D_2/D_1} \cdot (T_2/T_1)$, where the subscripts, 1 and 2, indicate earlier and later time periods respectively; D is the ratio of additional square miles per hundred thousand additional metropolitan population for a given period; and T is the length of the period in years. D is an expression for a real growth; hence its square root is extracted to convert it into an expression for linear growth: Large variations in the value of D have occurred in various time intervals. The value has ranged from 4.9 to 9.7 square miles per hundred thousand population increment for the high-density category, from 3.0 to 12.0 for medium density, and from 18.7 to 36.5 for low density. In order to apply the formula b = aK, with any hope of fruitful results, it would have been necessary to anticipate the great changes in the value of D that occurred after 1940. These changes resulted from new subdivision standards and increased emphasis on single-family dwellings. In retrospect the changes are easy to explain, but they would have been difficult to anticipate and evaluate in 1940. Nevertheless, it was assumed for the sake of argument that the value of D for 1940-1956 was predicted, and the extrapolation was carried out according to the procedure described above. Roughly 80 per cent of the forecast was made by this direct cartographic extrapolation.

12. In some places this procedure caused a boundary to be projected into a patently impossible location or into the same section of land from two different directions. The resulting square miles of projected "impossible" expansion were considered "available surplus." The map was searched for areas that had terrain and accessibility characteristics analogous to those of the expansion areas from which the surplus squares had been projected. Then the suprlus squares were added to the projected growth at the nearest analogous place.

The Geographical Review, Vol. LI, No. 1, 1981, Pl. I

URBAN SETTLEMENT PATTERNS, MINNEAPOLIS-ST. PAUL, 1900–1980

LEGEND

- High-density areas
- Medium-density areas
- Low-density areas
- Suburban railway service
- Interurban electric line
- Paved state or federal highway
- Major highways (4 lanes or more, including freeways)

Square miles dominated by:

- P — Public parks or grounds
- I — Industrial use or trackage
- CBD — Central business district

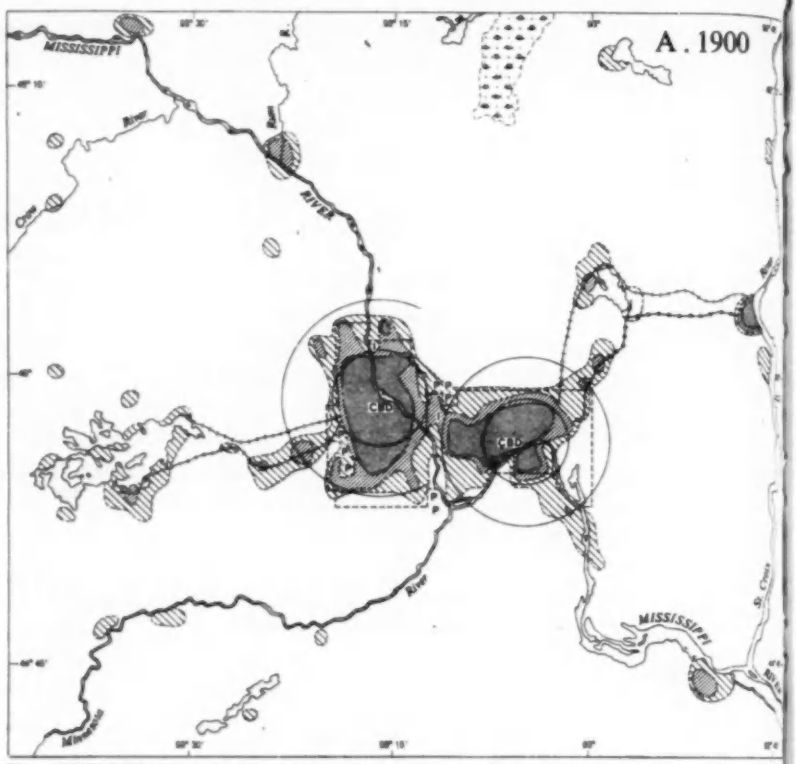
Rings represent limits of urban settlement which would have existed if growth had been in concentric rings from the two cores. Inner ring encloses theoretical high-density area; outer ring encloses theoretical medium- and low-density areas.

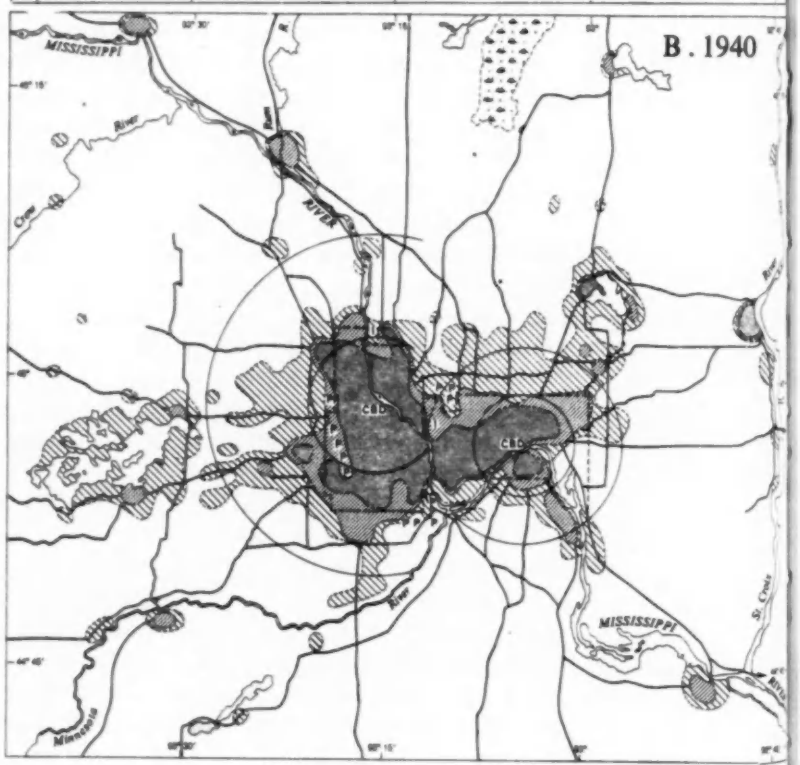
A — Pattern of urban settlement and main suburban transportation routes, 1900.

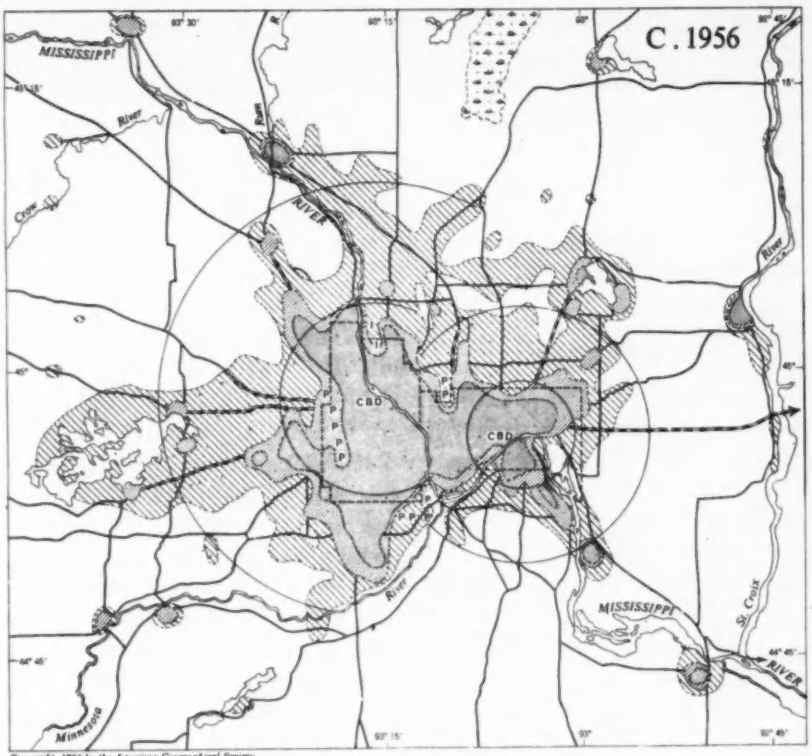
B — Pattern of urban settlement and paved state and federal highways, 1940.

C — Pattern of urban settlement and paved state and federal highways, 1956.

D — Projected pattern of urban settlement and paved state and federal highways in the low-density areas, 1980.







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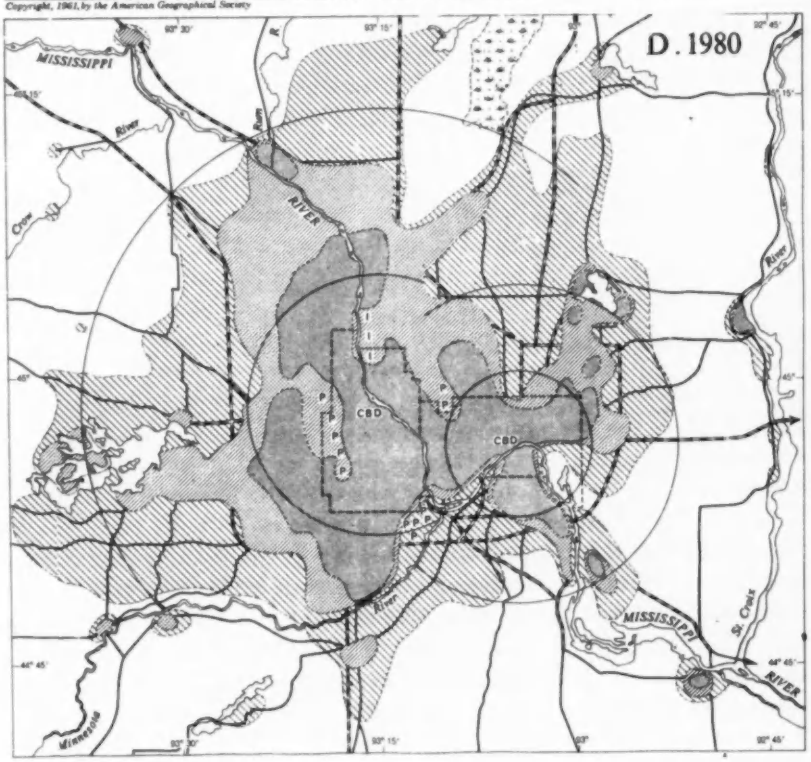

13. The prognoses that resulted were compared with the magnitude and direction of the expansion that actually occurred in each density category from 1940 to 1956. In the high-density class the procedure predicted 81 per cent of net new square miles, and 95 per cent of the square miles forecast actually developed; in the medium density class the percentages were 86 and 88 respectively; in the low-density class 71 and 78.

14. The Pattern in 1980. The procedure described above was next applied to the projection of 1940-1956 growth in 1980. A population of two million, the minimum of several Metropolitan Planning Commission estimates, was accepted for that year. This is an increase of about 693,000 over the 1956 metropolitan population. The forecast population increase was compared with the increase in low-, medium-, and high-density square miles projected in Figure 10. The composite 1980 map of total Twin Cities urban and fringe settlement appears on map D.

15. In search of possible inconsistencies, the 1980 prognostic map was related to the Metropolitan Planning Commission's gross dwelling-unit forecast for 1980. The commission report anticipates a need for an average of ten new dwelling units for every thirty-four additional inhabitants. Thus a 1956-1980 increase of about 693,000 residents means about 204,000 new dwellings units. Table III shows that the population distribution interred from the prognostic map is consistent with an independent forecast of total population and dwelling units.

16. The 1980 prognostic pattern depends on the assumptions (1) that currently available population forecasts are correct and (2) that postwar concepts of new housing financing and subdivision -- the administration and technology of urban expansion -- will continue essentially unchanged. There are indications in the Twin Cities and in American cities generally, that the second assumption may break down in the near future or perhaps is breaking down already. The most likely foreseeable consequences include more apartment-house construction (growing importance of vertical, rather than horizontal, expansion of the high-density areas) and increased extension of paved streets, seweraged, and water systems -- that is more systematic and complete development of street grids on the advancing frontier of high-density subdivision, hence more high-density and less medium-density development. The effect of these trends on low-density settlement is likely to be negligible. The urban pioneers may be expected to head for the outer frontier of the metropolis in as large proportions as they have, at least, since 1900.

Abstracted from "Land Economics"
Volume XXXVII, Number 1, February
1961. Pages 18-31.

COST-PUSH OF URBAN GROWTH

Henry B. Schechter

1. Henry B. Schechter is a financial economist with the United States Housing and Home Finance Agency. His purpose is to review the findings of change in the pattern of urban growth, examine the nature and general magnitude of increased economic costs as related to the changed pattern of urban growth and note the possible effects with regard to inflation and economic growth.

2. THE SECULAR CHANGE. A basic change in the locational structure of the United States economy in recent years has been the "ribbon development" of land for urban uses. Such development has been under way longest and most intensively with respect to nonfarm residential development. This pattern assumed dimensions giving rise to the term "metropolitan explosion" in the current decade. Census figures for all 166 standard metropolitan areas as defined in the 1950 census show that, from 1950 to 1959, in standard metropolitan areas the rural areas outside the central cities had an 85-percent increase in population (117 percent for the rural nonform areas). The urban areas outside the central cities had a 25-percent increase and the central cities only a 1.5-percent increase. [1]

3. More recent than the residential deconcentration has been a trend toward industrial deconcentration. The reasons for diverse industrial locations were analyzed in a Detroit regional study. It was concluded that the pattern of industrial location in the Detroit region followed from the previous leap-frogging effect of urban residential growth. The leap-frogging development had resulted in disconnected areas and a plant requiring a large site has to be located at the outer edge of the urban areas where large vacant land sites remain. [2] As a consequence of such patterns of development, industrial workers (and domestics) increasingly commute "out", while the white-collar workers who located in the residential suburbs commute "in".

4. A notable departure from the radial extension of industrial development was the Route 128 circumferential highway development in the Boston region. This horseshoe-shaped highway around the landlocked sides of

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1. U.S. Department of Commerce, Bureau of the Census, Current Population Reports. Civilian Population of the United States by Type of Residence, April 1959 and 1950, Series P-20, No. 98, Jan. 25, 1960, p. 1.

2. Detroit Metropolitan Area Regional Planning Commission, Features of Industrial Location in the Detroit Region (Detroit, Michigan: August 1958) p. 8.

Boston bisects many of the radial highways shooting out of Boston in all directions and passes near many of the bedroom communities on the radials. Therefore, as industry locates extensively along the circumferential highway the needs for transportation presumably should be reduced. The dispersion of plants and residential communities is great enough, however, the "just about all of the thousands whose jobs taks them to the fringes of the circumferential road travel in their own vehicles or in car pools."[1] In fact so much auto traffic is being generated that some sections of Route 128 built eight years ago are being widened from 4 to 8 lanes.

5. THE INCREASED ECONOMIC COSTS. The following discussion utilizes available microeconomic data which illustrate the increase in cost of various services related to the pattern of urban developments, and microeconomic data which can indicate roughly the magnitude of the aggregate additional cost with regard to each type of service involved. Data used to indicate aggregate additional cost are for the period between 1953 and 1957, the last complete business cycle period for which detailed annual national income data are available and one in which the average annual increase in real gross national produce was less than 2.7 percent.[2]

6. Local Travel. An illustration of increased local travel is provided by data in a study of travel in the Washington, D. C. metropolitan area in 1948 and 1955 by Jacob Silver. Between these two years the total population in the area increased by 31 percent and the total number of dwelling units by 44 percent. The total number of average weekly intra-area, work, shopping and other trips by people in autos, taxis, and mass transit vehicles, increased by 42 percent, about the same as the number of dwelling units. However, the estimated aggregate mileage represented by the total average number of weekly intre-area trips increased by 71 percent.[3] The total mileage for the average number of weekly inter-area shopping trips showed a 107-percent increase, for work trips a 49-percent increase, and for other inter-area trips a 73-percent increase. The greatest increases in intra-area travel trips have been in trips made by automobile, with some increase in taxi trips and a sharp decline in mass-transit passenger trips.

7. In mass transit riding, there has been a general decline in urban areas in the United States. From 1945 to 1955 the number of revenue passengers carried on transit lines declined from 18,982 million to 8,756 million.[4] The straight line elongation of distances along high-

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1. A. S. Plotkin, "Transportation Facilities on Route 128", Greater Boston Business Magazine, Route 128 Supplement, 1959, pp. 6-7, 54-55.
2. U. S. Department of Commerce, Office of Business Economics, "Gross National Product, National Income and Personal Income, 1929-1958", Survey of Current Business, July 1959, p. 7
3. J. Silver, "Trends in Travel to Central Business District by Residents of Washington, D.C., Metropolitan Area, 1948 and 1955 "Public Roads,"April 1959, p 153-176. Aggregate mileage was estimated by multiplying the number of trips shown by Silver in Two-mile class intervals by the mediam distance in each class interval.
4. American Transit Association, Transit Fact Book, 1957 edition (New York; 1957), p. 8.

ways between major urban centers and places of residence has caused a vicious cycle of increased mass transit costs and fares and declining passenger revenue.

8. Water Supply. The following figures indicate that 80 percent of the public water system served communities of 5,000 or less population. The size of water system and number of density of customers are significant factors in determining costs and charges to consumers. Thus, in a 1955 survey by the Tennessee State Health Department of metered residential water rates charged in communities with public water supply systems (publicly- and privately-owned), variations in average rates for 2,500 gallons of water by population size were as follows:

UNITED STATES[1]		TENNESSEE[2]	
Population Served	Number of Water Suppliers	Population Group	Average Rate
Over -- 100,000.....	93	35,000 -- 400,000.....	$ .94
10,001-- 100,000	1,141	10,000 -- 35,000.....	1.42
5,001-- 10,000	2,667	5,000 -- 10,000.....	1.83
1,001-- 5,000	8,314	3,000 -- 5,000.....	1,96
		1,000 -- 3,000.....	2.13
Under -- 1,000	8,346	Under -- 1,000.....	2.06

9. Household Gas. Increased costs of bringing gas to households were reflected in a 1953-56 increase of about 10 percent in the price index of gas sold to households. American Gas Association data suggest that part of the price increase represents cost increases due to a relatively greater increase in miles of distribution mains (23 percent) than in customers (14 percent).

10. Telephone Service. Influences similar to those affecting gas costs, can be traced with respect to telephone service costs where the effects were reflected in increased telephone service charges, more in 1949-53

Table II -- Percentage Changes in Number of Telephones, Local Calls, Miles of Telephone Cable and Aerial Wire, and Telephone Price Index During Selected 4-Year Periods

Period	Percentage Increases In -- Number of Telephones	Annual Number Local Calls	Miles of Cable and Aerial Wire	Customer Telephone	Price Index All Items
1953-57	27	26	42	5.8	5.1
1949-53	22	15	27	17.9	12.3
1935-39	21	23	9	-1.8	1.2

Sources: Telephone industry information -- Federat Communications Commission. Statistics of Communications Common Carriers, for year

1. H. E. Jordan, "The Problems that Fact Our Cities," Water, Yearbook of Acriculture, 1955 (Washington D. C.: United States Department of Agriculture) p. 651.
2. Tennessee State Planning Commission, Sanitary Service Charges in Tennessee, Nashville, Tennessee, 1955, p. 17, 18.

ending 1957, p. 20-21 Consumer Price Index -- Price Indexes for Selected Items and Groups, Washington, September, 1959, p. 4-5.

11. Electric Utilities. In the case of electric utilities there was a reduction in per-unit (kilowatt hour) charges between 1953 and 1957 which apparently resulted from reduced unit costs. This came about through an increase of 51 percent in annual residential sales while only a 41-percent increase in plant investment occured between 1953 and 1957. There was a 32-percent increase in per customer consumption, allowing greater utilization of existing lines, plus a 14-percent increase in the number of residential customers. With the aid of these developments there was a small reduction between 1953 and 1957 in the average private electric company revenue per kilowatt hour sold for residential use. [1] It is likely, however, as indicated by one electric company executive (Laidlaw), that greater reductions in electric utility rates have been prevented by the sprawl and scatter of our metropolitan area land use development. [2]

12. Public Schools. Expenditures for local elementary and secondary public schools constitute the largest expenditure for a single function by state and local governments. The economics of scale in construction and equipment of schools are illustrated in a study of Isard and Coughlin based on elementary school building in Connecticut and secondary school construction in Massachusetts. They estimated that construction costs per square foot were 22 percent higher for a 20,000-square-feet elementary school and 33 percent higher for a 10,000°square-feet school than for an elementary school building of 60,000 square feet. For a 40,000-square-feet secondary school building, the construction cost per square foot was estimated to be 8 percent higher than for a 60,000-square-feet building, but lower than for the latter by 12 percent for a secondary school of 180,000 square feet. [3] They also cited data on per pupil operating costs in several states which showed that per pupil cost decreased as number of pupils in a school increased.

13. Sewer Service. Sewage treatment plant capital and operating costs also have marked economies of scale. The great majority of community sewer systems in the United States serve small populations. Furthermore, as the population increased over the 12 years, 1945-57, there apparently was an increase in the proportion of the population served by small systems. Thus, from 1945-57 the proportion of the total sewer-

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1. Federal Power Commission, Statistics of Electric Utilities in the United States, Privately Owned (Washington, 1957 p. xxiii.
2. C. D. Laidlaw, "Utilities in and Out of Planning", in Urban Problems and Tecniques, P. L. Norton, editor (Lexington, Massachusetts: Chandler-Davis Publishing Co., 1959) pp. 130-154.
3. W. Isard and R. Couglin, Municipal Costs and Revenues Resulting from Community Growth (Wellesley, Massachusetts: Chandler-Davis Publishing Co.) p. 71.

connected population living in communities with populations of under 10,000 increased from 19 percent to 21 percent, but the proportion living in communities of over 100,000 decreased from 49 to 45 percent. [1]

14. Highways. It is not feasible to delineate increases in highway construction expenditures caused by local travel requirements related to the new pattern of urban growth from construction expenditures generated by other travel. A great deal of expensive multiple-lane highway construction in recent years, however, has been in response to heavy daily suburbs-to-city-and-return traffic. It has been estimated by Francis Bello that about half of the expenditures for the interstae highway system (being built with 90-percent federal grants-in-aid) will be for 5,500 miles of high capacity urban expressways, going around or into cities of more than 50,000 population. [2]

15. The Magnitude of Increased Costs. There are doubtless other private and public functions and services which have become more costly as a result of the changed pattern of urban growth. On the other hand, the various expenditure increases are only partly due to inefficiences introduced by our plant layout for urban living in recent years.

16. As a point of departure, however, it is noted that in constant (1953) dollars, after adjustment for population change, the estimated aggregate 1953-57 cost increase for six functions was $6,918 million. In 1957-GNP[3]-price-terms the increase was about $7.5 billion. It is assumed that one-third of the constant dollar expenditures increases, adjusted for population change, is due to upgrading in the quality of services and desired per capita consumption increases, there would still remain an increase of about $5 billion, more than 1 percent of the 1957 GNP. This indicates roughly the magnitude of the increase in real costs arising over a four-year period from economic inefficiencies related to the current pattern of urban development.

17. It appears likely, therefore, that a continuation of post-world War II urban growth patterns would continue to foster less-than-optimum capital and operating facilities for certain everyday functions. This resultant uneconomic use of resources tends to restrict total capital growth in the economy and makes for cost increases. This exploratory study suggests that the magnitude of the real cost increase involved probably is significant enough to warrant much more intensive study of the problem in order to provide guidance for policies that might promote a more rational pattern of land use development.

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1. J. R. Thomas and K. H. Jenkins, Statistical Summary of Sewage Works in the United States (Washington, D. C.: US Public Health Service, 1958), p. 26-27.
2. F. Bello, "The City and the Car", Fortune, October 1957, p. 158.
3. GNP = Gross National Product

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APPROACHES TO ANALYSIS OF CENTRAL BUSINESS DISTRICTS

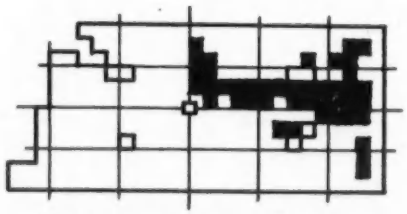
John Rannells

1. John Rannells has been engaged in center-city studies since working with Francis S. Swales in 1926 on the architectural studies for East Side and West Side Manhattan, published in the Regional Plan of New York and its Environs. After some twenty years in Architectural offices, he joined the staff of Columbia University's Institure for Urban Land Use and Housing Studies, where he wrote The Core of the City (Columbia University Press 1956). Since 1955 he has worked with the City of Philadelphia's Urban Traffic and Transportation Board, where the current policy emphasis is on the development of the city's downtown values.

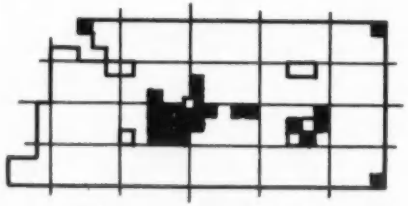
2. The CBD is not only an intense concentration of activities vital to the entire region. It is also a heterogeneous collection of activities that are important in the aggregate-supporters of central services and space-fillers using obsolete structures. Indeed, the aggregation of obsolete but well-located buildings, whether on the fringes or in blighted sports within the CBD, act as incubators for the continual formation of new business firms that need the access to services and labor that can be found only in the center. When these establishments prosper and require more space, they are likely to seek better accommodations and others move in.

3. It is to be remembered, always, that there are distinct economic advantages to central location -- primarily the concentration of joint opportunities to be found there. But as metropolitan areas grow in population, and grow even more in physical extent, there central-district activities grow more slowly, since the advantages of centrality must be coupled with advantages of accessibility; and some fraction of central activities find that sub-centers become better locations for them, closer to the people served and at lower rents.

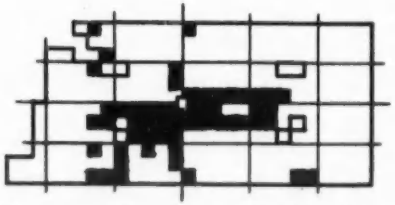
4. Types of Approach. Studies of retail sales, land values, daytime population, and functional classification are summarized in The Central Business District in Transition (City and Regional Planning Studies, Research Paper No. 1, Chapel Hill: Department of City and Regional Planning, University of North Carolina, 1957) by Shirley Weiss and noted briefly below.



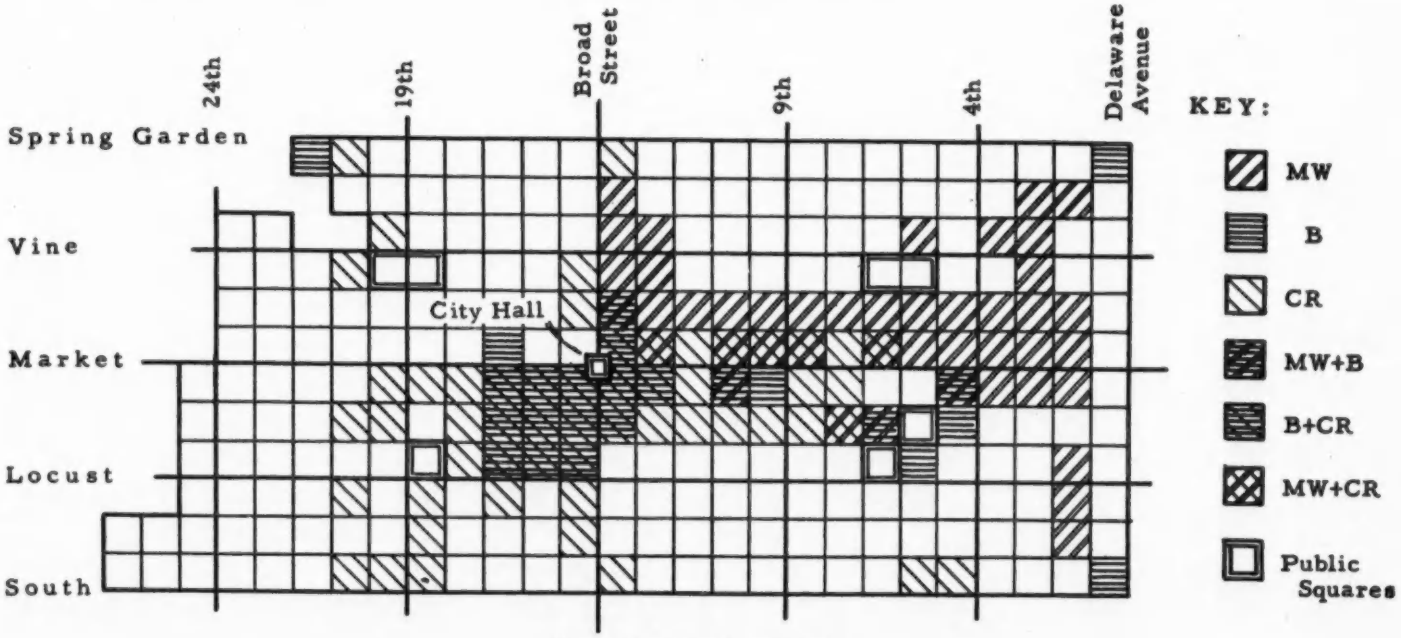
MANUFACTURING AND WHOLESALE WITH STOCKS (MW)



BUSINESS SERVICES (B) INCLUDES WHOLESALE WITHOUT STOCK



CONSUMER SERVICES AND RETAIL (CR)



THREE GROUPS SUPERIMPOSED

FIGURE 1. DISTRIBUTION OF ECONOMIC ACTIVITY IN CENTRAL CITY PHILADELPHA

a. Retail Sales - Because shopping goods tend to concentrate in market centers, retail trade volume is an excellent indicator of the economic vitality of the CBD.

b. Land Values -- Land values, as a measure of the importance of the CBD, broadens the picture given by retail sales. In fact, with the one exception of the New York Financial Dictrict, the highest land value is found in the center of the retail shopping district where pedestrian traffic is heaviest.

c. Daytime population -- It is the prime function of the CBD to provide opportunity for concourse of people -- to work to shop, to do business, to seek professional advice, and so on. Noon-hour crowds on the sidewalks are the most obvious indicators of this concourse, while off-peak flows, when the working people are not on the street, have been shown to focus sharply in the areas of high land value.

5. Functional Analysis. The different kinds of central activities can be located by means of business directories (or even the classified telephone books) and analyzed for concentration or dispersion or the mix to be found at a particular location. Shifts within, or in relation to, the rest of the metropolitan area can be described and forecasted by this method. This functional approach is only the beginning, and must be combined with other techniques and a fairly rich collection of data on floor space used, employment, etc. for an adequate understanding of any particular CBD.

6. A thorough study of this kind was made in 1949 for the Philadelphia City Planning Commission. Designed to forecast the need for floor space in various categories, this study was based on an "inspection" census from which was drawn a sample survey of floor space, rent, number of persons employed, and locational factors -- transportation for persons and goods and nearness to suppliers, customers, competitors, etc. The study area was delimited by a preliminary sample listing of establishments from the classified telephone directory, purposely taking in a generous area to include all central activities. Within this area, the major concentration of functions (measured by number of establishments or floor space in the various categories) was found to occupy an irregular central core, the extent of which could not be sharply defined since it actually consisted of several overlapping concentrations (Figure 1).

7. The foregoing study demands classifications of uses. Such classifications are adequate for problems of analysis in a specific city but provide little basis for comparisons among different cities, except perhaps in terms of the relative strengths of their central districts, measured by percentage of regional employment or tax assessments or retail sales.

8. Comparative Analysis. For comparative analysis of central districts, a basis has been established by geographers Murphy, Vance, and Epstein of Clark University in Central Business District Studies (Worcester: Clark University, 1955). The CBD is delimited by including all blocks that fulfill two indexes of central-district use: a height index of 1.0 or more and an intensity index of 0.5 or more, ie., space used by "the retailing of goods and services for a profit and the performing of various office functions" occupying in the aggregate at least one floor in the blocks and at least half of the floor space in use in the block. These measures are admittedly somewhat arbitrary but they have the great virtue of standardized application, allowing valid comparisons of a variety of cities. Land uses were analyzed by four zones centered on the 100 per cent location of a variety of retail, office, and "non-central" uses, not only in the aggregate but also for first, second and upper floors. The often-observed tendency of the CBD to gradually shift its location is recognized by identifying "zones of assimilation" and "zones of discard," the former occupied by specialty shops, automobile showrooms (at the expense of good residential areas), the latter occupied by low-grade establishments bordered by railroad and industrial areas.

9. A Conceptual Approach. Ernest Jurkat, who directed the Philadelphia Central District Study of 1949, has improved its techniques in a series of further studies of metropolitan scope. Although he has not yet made a complete statement of his theoretical basis, Jurkat's findings add greatly to our understanding of the dynamics of economic activities as they are expressed in land use. In recent studies for Baltimore and St. Louis, for example, he finds that the key to location of establishments is the productivity level of the space in use; expressed as value added per square foot of lot, and that small establishments play an important part. Thus, in his Baltimore study, he states:

> There is a need and demand for centrality not only of functions with high purchasing power for floor space but also of functions of lesser productivity relative to floor space. There other functions either serve the primary Central District functions or are dependent on the services provided by them. If maximization of land value, i.e. the tax base is a goal of planning (then) as a high concentration of the Primary Central District Functions as possible should be used as a means not only for realizing the highest potential of value creation anywhere, but also for expanding the land and floor space supply for those goods handling functions which combine a high productivity per worker per year with need of centrality of location and large floor space requirements. . . Increase in productivity is (thus) brought about and results in further functional specialization favoring small and medium-sized establishments. Because of their need for out-

1. Baltimore Central Business District Projections, prepared for the Planning Council of the Greater Baltimore Committee by Marketers Research Services, Inc., May 1958, pp. 111-10 ff.

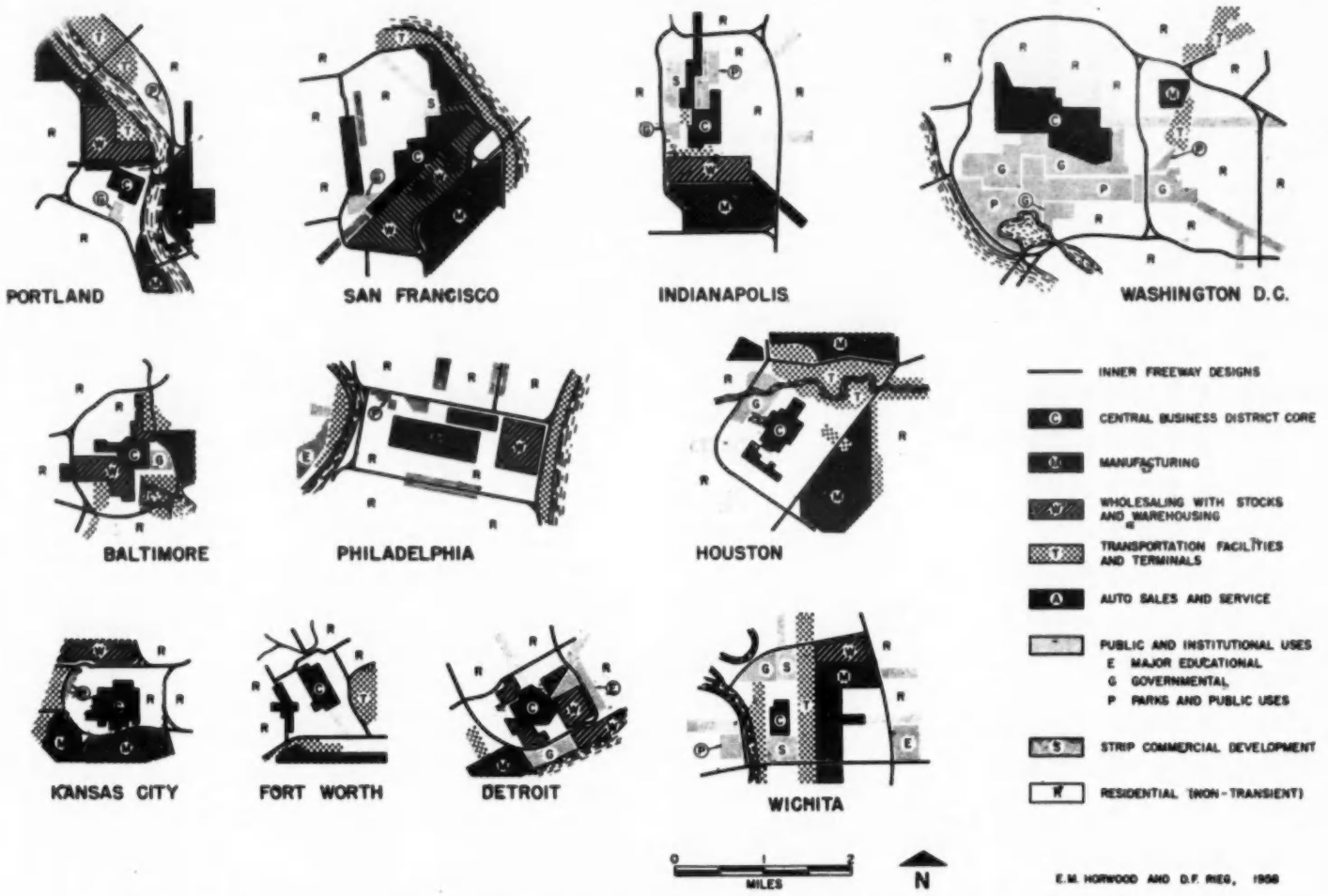


FIGURE 2. SELECTED CBD'S AND INNER EXPRESSWAY RINGS. *Studies of the Central Business District and Urban Freeway Development* (Seattle: University of Washington Press, 1959)

side services in production and manufacturing these small establishments will tend to locate as centrally as possible and due to their level of productivity, also be able to do so.

10. Jurkat identifies as the core only the small area of greatest productivity, to which he adds a fringe in which are located activities that need central location but are unable to pay for core space, and a less definite belt which extends beyond the CBD and merges with near-central wholesaling, manufacturing, and residential uses.

11. The Future of CBD's. In a comparative study of central business district structure and change by Horwood and Boyce, core and frame areas are distinguished and related, in a dozen cities, to the inner urban freeways designed for them. (Figure 2) This well-organized study pulls together a great deal of useful material and carries the comparative work begun by Murphy, Vance, and Epstein a step forward.

12. Not to be forgotten is the importance of movement, both of persons and of goods. Ease of access and interchange is one of the strongest factors in formation of the CBD in the first place and, with congestion, becomes a strong factor in sorting out activities within it or relocating them elsewhere.

13. Much can be done with CBD research based on the facts as we find them when those facts are illumined by a working knowledge of the various urban activities and their trends, as described in a multitide of studies. But for anticipating the shape of future urban development, as it will be distributed between center and region and among competing regions, and as a guide to physical planning of improvements designed to enhance CBD values, we need to develop a stronger body of tested theory than we now possess.

14. Conclusion. The conclusion is borrowed from Professor Florence's fascinating paper on "Economic Advantages and Disadvantages of Metropolitan Concentration" (The Metropolits in Modern Life, New York: Doubleday, 1955) in which he examines a great many characteristics of city size and develops a hierarchy of city functions based on their "coefficient of localization". He cites the following from Boswell's Life of Johnson (entry for September 30, 1769) as typifying the advantages:

"Johnson: 'The happiness of London is not to be conceived but by those who have been in it. I will venture to say, there is more learning and science within the circumference of ten miles from where we now sit, than all the rest of the kingdom.

Boswell: "The only disadvantage is, the great distance at which people live from one another.'

Johnson: 'Yes, Sir; but that is occasioned by the largeness of it, which is the cause of all the other advantages.'

Boswell: 'Sometimes I have been in the humor of wishing to retire to a desert.'

John: 'Sir, you have desert enough in Scotland.'"

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THE FORM OF THE CORE

Blanche Lemco van Ginkel

1. Blanche Lemco van Ginkel is in private practice in architecture and planning in Montreal, in partnership with her husband, H. P. D. van Ginkel. She has worked in both fields in Canada, the United States, England and France; she has designed exhibitions and produced films, and has taught at the University of Pennsylvania and Harvard University.

2. The spate of recent plans for redevelopment of the core of our cities reflects more than economic pressures and traffic strangulation. Most solutions are presented in terms of efficiency and land use economics, but many seek beyond this to create an environment with new characteristics. We are dissatisfied with the image evoked by most of our cities. Our dilemma is that emotionally we like the old European city, but we also want the advantages of contemporary technology and are forced to recognize the dictates of economics.

3. Our search for a new image is doomed to failure as long as we ignore two prime factors: first, that form and not design produces the image; second, that fragmentary projects cannot produce the totality of the core.

4. The Essential Form. The heart of the city which has a sharp and evocative image is one which has a strongly identifiable form. The urban form is distinct from architecture and design. The form of San Giminiano-- a cluster of towers rising from massed low buildings, crowning a hill--is an unforgettable image. The design--of its buildings and spaces -- is relatively inconsequential. The same is true of Lower Manhattan, the impact fo whose form is in no way lessened by frequently timorous design. The image of Amsterdam is in the concentric rings of canals and the massing of buildings which border them, rather than in the obiquitous boroque facades.

5. Form and Function. Good urban forms are derived from function -- but function in the human and not the mechanistic sense. This should be the basis of a good design program for the center city. A good program alone does not produce great architecture or urban design-- but without a good program the design can be no more than handsome or decorative.

6. A Program for the Core. The current emphasis on the CBD arises perhaps from the preoccupation with functioning instead of with function. The trouble with the city center is not that it does not work, but that it should perhaps be doing a different job. To the extent that it is so, form follows function and not functioning. In this context function must mean the human function of the core of the city in which there is the complexity of and richness of all man's activities and aspirations. Although in general this means a mixture of functions at the city center, the proportions and relationships of each vary from city to city. Thus the "right" form varies from city to city, as it always has.

7. Current Approaches. In North America, with the exception of a very few new towns, the creation of a new city image means redevelopment. Current concepts in redeveloping existing downtowns are divided between intensifying the uses at the core and attempting an even distribution of activity over the entire downtown area. The latter is exemplified by Victor Gruen's Fort Worth Plan which is basically a shopping center downtown. It has no one hundred per cent retail location. The underlying concept is that all pedestrian traffic is to be evenly distributed. Gruen says that downtown office expansion "should take place by the establishment of separate office groups or centers rather than an enlargement of the existing district."[1]

8. In contrast, a few downtown plans, notably those of Baltimore and Philadelphia, try to accentuate the intensity of the core. (Figure 3) This has more validity in terms of the basic principle of maximum conpactness and concentration, and it offers greater possibilities for variety and visual impact.

9. Almost all recent plans assume that the downtown area should be finite. This in itself can give much needed definition and emphasis to the core. In many instances the definition is by means of a bounding expressway (See page 57). An inner expressway ring frequently is the best traffic solution, but unless it is designed with great care it can become an insuperable visual barrier between the core and its city. Although the core needs definition it should not be divorced from the city.

10. Downtown as a Totality. It is inevitable that the rebuilding of the core proceed by small increments. But a plaza or building group, however fine architecturally, does not in itself change the form of the core. New projects must further a broad comcept for the area as a totality. The only projects which have validity are those which have some influence beyond their own boundaries.

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1. Victor Gruen and Accosicates, A Greater Fort Worth Tomorrow, 1957, p. 7.

11. The Center City Plan of Philadelphia creates a structure for the development of a new form for the entire downtown. Within the expressway loop, pedestrian circulation assumes the dominant role in articulation. The essence of civic design is in its time-space relationships. The form is revealed by moving through the city. Therefore, with much the same masses of buildings, the visual form changes if even minor alterations are made in the way in which one moves between them. The walkway plan for Philadelphia is a system of pedestrian spaces and connections, linking the five historic squares of William Penn. This plan can change the appearance of the city, not so much by the walkways themselves, but by the new sequence of vistas and the changes of scale and modulation of movement. Its effectiveness in producing a new visual form does not necessarily depend on new buildings.

12. The core can not have form without a concept of the totality. Conversely, projects tend to be whimiscal and trivial unless they are designed within the framework of a totality. A comparison between the housing competitions in Philadelphia and San Francisco is a case in point. Philadelphia's Society Hill competition had a program which presented a workable context to the urban designed, and indicated the pace of the new residential area in the center city fabric; it was possible to see how a new form might arise from the skeletal proposals for the total downtown, of which the housing is a part. In the Golden Gateway competition, the framework seemed to be dictated primarily by traffic proposals. The Freeway along the Embarcadero, which already has ruined the waterfront contact visually essential to a good port city, was the strongest factor affecting the design. It is evident that most of the proposals were preoccupied with fighting the expressway, which was an unnecessary waste of design energy.

13. The Fabric. Downtown as a totality has a fabric produced by the massing of buildings -- and perhaps trees -- and by the spaces between them. The principal open spaces are created by the streets. However, the dimensioning of a right-of-way and of the building envelope on either side sledom is considered from the design point of view. Traffic engineers and zoning administrators determine the nature of these most critical spaces and masses. Thus the fabric of American cities tends to be loose, coarse and uniform--the normal result of crude, mechanical production.

14. The density of the core should refect the density of activity. Its fabric should be tightly woven. The strength of the wall is emphasized by the opening in it. The opening itself has positive characteristics. As Henry Moore said, "Holes, or rather spaces, have always been important to me because they seem to be the same as solid form, only negative. If you cut out a cave in a hillside it is the shape of the cave you worry about, not the hillside." The mass depends on the volume for it visual force, each derising strength from its relationship with the other.

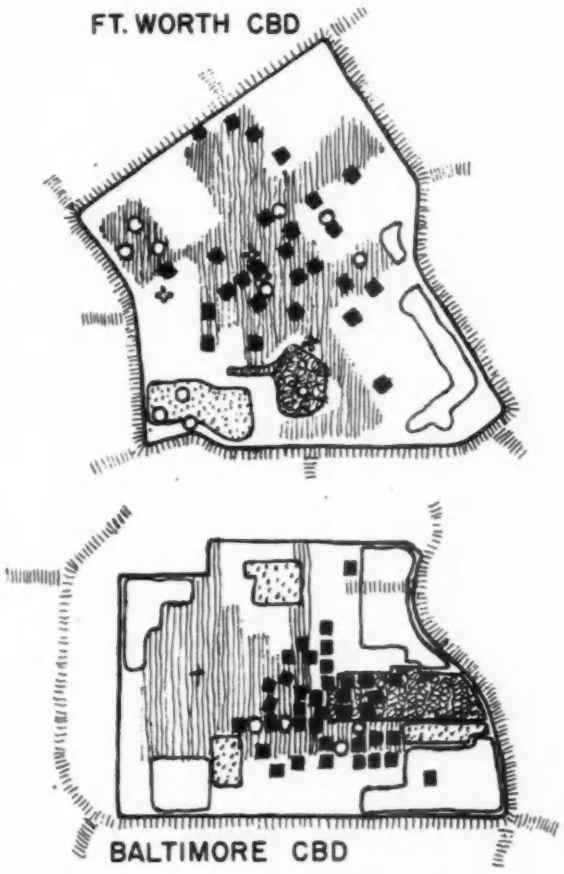


FIGURE 5. PLANS FOR FT. WORTH AND BALTIMORE CBD's—A comparison between "evenly distributed" and "concentrated core" downtowns. Some interesting statistical comparisons of forecasts are: 1970 trade area population—Baltimore, 2.3 million; Ft. Worth, 1.2 million: total CBD floorspace—Baltimore, 36.3 million, Ft. Worth, 33.75 million; CBD retail floor space—Baltimore, 6.8 million, Ft. Worth, 9.6 million.

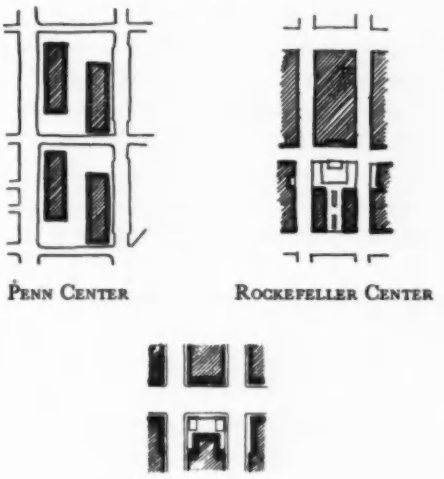


FIGURE 6. PENN CENTER—A NEW PEDESTRIAN STREET. ROCKEFELLER PLAZA—A FUNCTIONING URBAN SPACE. SEAGRAM'S PLAZA—A SETTING FOR A BUILDING.

John Adelberg

FIGURE 7. EXPRESSWAYS OPEN UP NEW VIEWS OF DOWNTOWN.

15. Malls. Recognizing the need to reinstate the service functions of the street, there are many plans to give the street back to the pedestrian. The walkway plan for Philadelphia is an outstanding example, which creates a sequence of spaces and connectors. Here the major pedestrian walks are projected at three levels -- below ground, at grade, and elevated -- which can increase the spatial at dimensions of the city. Having taken this approach, perhaps a three-dimensional solution will be found which is more exciting than the simple linear superimposition of three planes. Where the pedestrian route is freed in space from the carriageway, there is no longer reason to follow its direction.

16. Space and Spaces. Within the fabric of streets, squares and plazas should serve several functions. They can provide a visual focus and point of emphasis and, most important, they can fulfill their ancient role as a meeting place at the heart of the city. A good urban space is a functioning urban space.

17. In the contemporary American scene, Rockefeller Plaza is a prime example of a functioning urban space. In the complex of Rockefeller Center, the Plaza resulted from economics, by-laws, and the need to communicate between buildings. The dynamic of people on foot passing through it is reinforced by the outdoor activity within it -- the skating rink and restaurant -- and by its pedestrian connection with Fifth Avenue through the formal garden. In terms of civic intent it is no more than the space serving commercial purposes, but it has become through its design and use the most important civic space in central Manhattan -- making a real contribution to the life of the center city and to the metropolis as a whole. In contract, the plaza of the Seagram Building, a more urbane design, serving more distinguished architecutre, contributes little to the downtown in a civic sense. Like the Campidoglio, one comes to see it --as to enjoy paintings in a museum. It has formal entrance and no exit; it is not to pass through and pause, but to come to and stop. The walks along the adjacent streets set it apart visually from the normal city ways. The direction of its composition is clearly intended to enhance the Seagram Building without particular concern for the vulgus. (Figure 6).

18. The Treatment of Urban Spaces. Spaces of different functions have a place at the heart of the city. Each has a different program which demands a different approach to circulation and furnishings -- and to form. The major space, the heart itself, is the most intensely urban. It should be a meeting place and a pedestrian thoroughfare, like Rockefeller Plaza. Here, pedestrian traffic is drawn through, and the entrances are not confined, although contained. This is contrasted against a space which serves the ends of decoration, quiet, and repose, the breathing space of downtown, and a brief respite from density.

19. Common to all downtown spaces is the requirement of containment. In the civic space, it is the strong containment of building masses, while the place of repose may also derive its character from inner containment of trees. Trees are an essential human element in the city, but unfortunately they are used too frequently only as decoration, and not as design elements in their own right. At the heart, in the most urban places, trees only have validity at the mass and scale of the building. Four or five trees will not hold down the corner of a plaza, although they may save the composition in a perspective drawings.

20. Scale of Movement. New expressways on the fringe of downtown are opening up new vistas. The visual impact of the core at this first view deserves careful consideration. The speed of movement on the expressway demands a commensurately large scale in this particular image of the core. At the speed of the automobile the form of downtown in important not only as a distant view but also at the moment of transition, on approaching and entering it. It is not easy to solve the visual problems of arrival and departure with the contemporary means of access--the expressway and the subway. The moment of arrival in the city center should have impact and significance. The parking garage may be a technically correct terminus for the expressway, but a transition is needed to create a proper visual expression of journey's end, a place of arrival.

21. Smaller Urban Centers. A successful urban form is not limited to big cities. Many small American towns have a truly urban character. Here again the lessons of the past seem to indicate a greater density at the core and a focus of circulation. The New England town center has the quality of urbanity without being intensively urban in character as opposed to many Mid-Western cities whose main street is urban with its "skyscraper" but completely lacking in urbanity.

22. Urbanity stems from the conscious expression of the city as a purposeful community. It is the refinement of the urban art of building masses and enclosing spaces, embracing the smallest details of joint and surface. Urbanity is in fine materials beautifully worked and in common materials ennobled by perfect detailing; it is in the street which is more than a carriageway, having its own visual identity; it is in the square which is more than residual open space. Urbanity is a manifestation of sophisticated people -- of those who have polished their wits and their senses by rubbing against each other in the close confines of the city.

23. Plans for the Core. Plans for the reconstruction in the downtown area abound, but few really establish a new core by giving it form and focus. Fewer still give promise of real success in establishing memorable results.

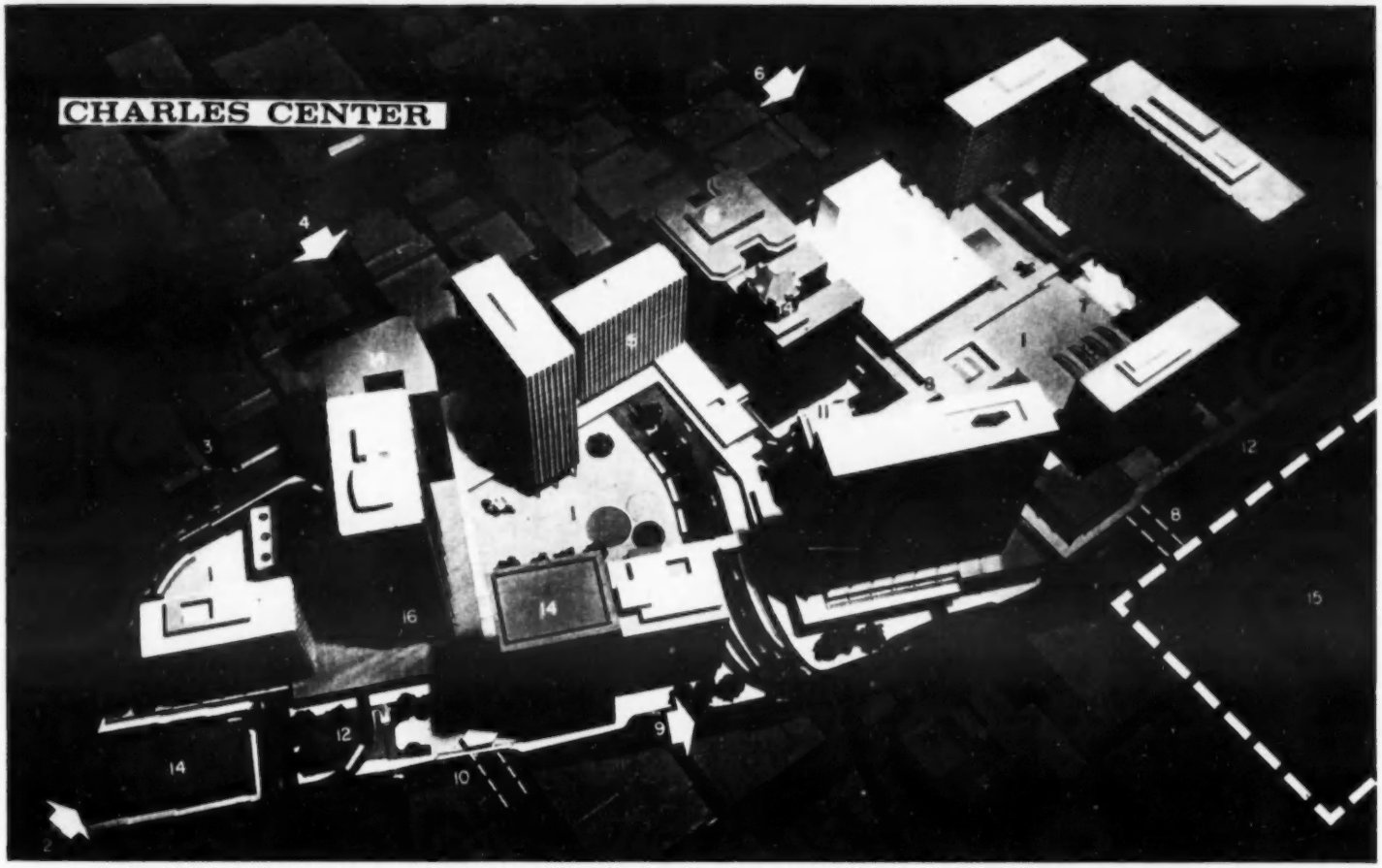


Photo: Marion Warren

FIGURE 10. CHARLES CENTER, BALTIMORE. PROVIDING A NEW FOCUS FOR DOWNTOWN. IT CAN GIVE FORM TO THE CORE.

1 Public open spaces with landscaping. 2 View south from Cathedral Street looking into Charles Center. 3 Church and Mansoic Temple become strong elements across from new park. 4 Lexington Building tower dominates view west on Lexington Street. 5 Building position provides sense of enclosure to open space and light and air to existing structures. Street under provides dramatic entrance. 6 Unobstructed view west from Redwood Street into south park. 7 Open view to south under office building. 8 Moving walkways above streets tying development together. 9 View south on Liberty Street is dominated by a new Civic Center. 10 Future pedestrian overpass over Liberty Street at Lexington to link shopping center to west with Charles Center. 11 Small tower provides visual punctuation. 12 Parks on fringe to link Charles Center to future renewal activity. 13 Pedestrian entry and exit to transportation terminal. 14 Existing buildings to remain. 15 Civic Center site. 16 View east from shopping center terminated by new building.

24. Pittsburg's Mellon Square opened up a new space, but suffers as a traffic roundabout. The needs of the automobile were paramount, and the plaza, which should have been treated as a depressed space, sits like a wedding cake in the center. It is too evidently the roof of a garage. Gateway Center is a fringe development.

25. New Haven's Church Street Project reaches to the heart. However, it puts the strongest element, the department store, firmly on the fringe, oriented to the expressway. The present plan will create no new sense of compactness to the core, nor does it call for any open spaces to be related as a sequence to the great Common. Again with the connection to downtown from the expressway it will be difficult to give any strength or sense of entrance.

26. Philadelphia's plans for the center city, which have already been discussed, are among the few that establish a workable framework for the totality. Within this structure it is possible that a new form will arise. Most projects in other cities will fail because they do not have a valid context.

27. Charles Center. Perhaps the most complete attempt at providing a new heart for a revitalized downtown -- and one which can give form to the core -- is Charles Center in Baltimore. The Baltimore plan for the CBD is one of the most comprehensive, and Charles Center, which is its focus, illustrates many of the points made previously.

28. Charles Center is at the geographic center of the area, strategically located between the existing nucleus of high office buildings and intensive retail shopping. In area (22 acres) and in content it is of sufficient size and scope to change the form of the CBD by its presence and by its influence. It is a pedestrian precinct into which the automobile penetrates at separate levels. The site slopes down 66 feet in its 1,900-foot length from north to south. The steepness of grade has been used to effect the separation of traffic and to provide multilevel subterranean parking facilities. Starting at street level at the north end of the site, principal pedestrial circulation within the complex is always held a level above grade to cross Fayette Street and Baltimore Street without interruption.

29. There are three principal spaces in Charles Center. The upper one, adjacent street level, lends space to a facing church and represents an extension of Charles Center into the surrounding city fabric. The other two are introspective and contained by new buildings. The connection between the three plazas is via arcades and galleries, changing level by stairs or escalator, and by bridges across intervening streets. The different levels and the changing directions, derived from a bounding diagonal street, result in a complex relationship which may be visually very exciting. Yet the three plazas and their connections are sufficiently strong to give the plan coherence.

30. It would seem that the central plaza is destined to become the new heart of the city of Baltimore. Its focal location at the epicenter of diverse activities, its connections and approaches, and above all its plan, bespeck this function. But the design of the shopping galleries which surround it and of the landscaping is at the intimate level of the suburban shopping center. With circulation at two levels arising naturally from the conditions of the site, it is disappointing to find an opportunity to make the different levels work together in three-dimensions instead of as separate planes. Escalators are as necessary as automobiles for convenience, but a stair or ramp has more spatial and human possibilities in an architectural composition.

31. If the central plaza were designed with real walls and floors to noble proportions, it would be so arresting in itself that all the trivia of benches and petty landscape devices would automatically disappear. Paving or water would have to be at the scale of the space; and sculpture would have to be at the scale of the city, finding its own position where it is indespensable to the composition of the plaza. The places to sit would be an integral part of the whole, not benches which are capable of rearrangement like the furniture in a living room. . The historic urban spaces which are most admired do not contain street furniture or planting boxes as incidental decoration, and frequently not even trees. Yet people are very happy to sit there.

32. The pedestrian spaces are partly contained by low buildings. High blocks of offices and hotels create another spatial composition at a larger scale. The total composition at this higher level is at a larger scale. The total composition at this higher level is somewhat less coherent and consequently does not establish the counterpoint which it might with the plazas. However, in its parts it does skillfully establish relationships with existing high buildings in the business area to the east. This is an important aspect of Charles Center--that it is conceived as a part of a total downtown plan and that its form has a well-considered relationship to that which exists. A vital factor which should contribute to the success of Charles Center is the nature of its connections with the surrounding streets, spaces and buildings. They appear to be designed as much to go out from Charles Center to other centers of activity as to approach it. Charles Center may not yet be good design, but it has basic form--a new image for the core of Baltimore. It "lets the thing be what it wants to be."

33. <u>The New Form of the Core</u>. The form of these projects is derived from the juxtaposition of two scales of movement. The first produces a small scale of masses and spaces at ground level with penetrations to upper and lower levels. The second produces high building masses, widely spaced. The form is in the three-dimensional counterpoint between the two--in plazas, walks, arcades and bridges against towering masses. But the major problem today is to find an inspiring form of the core as a totality.

Report of the Fifth Urban Design
Conference, Graduate School of
Design, Harvard University, April 1961.

THE INSTITUTION AS A GENERATOR OF URBAN FORM

1. Institutions will play a great part in determining the form, scale and design of the American city over the next few decades. Institutions of learning, or government, healing, culture, religion, research and recreation are among the chief gainers from urban renewal projects and this trend seems likely to be accelerated. Yet those on the governing boards of such institutions tend to believe that their prime -- and indeed their only -- duty lies in securing that the institution is operated with the greatest possible internal economy. Most recognize no conceivable visual, relations -- of the institution with the community in which it is set. Indeed most would consider that any deliberate effort to improve a functional or aesthetic rapport with the rest of the city would almost amount to a betrayal of their trust.

2. There are several cogent reasons why this attitude is likely to change. First, the construction costs of most institutions are met -- at least in part -- from non-profit and tax-exempt sources; indeed often directly from tax funds. Second, their structures tend to be larger in size and more monumental in scale than any others in the city. Third, no public institution stands alone. Its erection sparks off much subsidiary development, ranging from hotels to secretarial bureau, various types of training establishments to specialized shops.

3. The public attitude toward a business man, risking his own money in the erection of a new office building or department store, must inevitably differ from its attitude toward a committee concerned with a project that falls directly within the area of the public weal. The principal aim of a business man must be to obtain a good return from his investment: the principal aim of a public institution must -- in the long run -- be the welfare of the public.

4. These considerations led the Harvard Urban Design Conference to examine the work of several enlightened institutions which are exercising leadership in this new field of public responsibility. Urban renewal programs in the USA are increasing in scale and it seemed appropriate to see what these could achieve in influencing the development of better settings of urban living. The five institutions selected for study were: one dealing with government - the Detroit civic complex; one with educational - the Charles River universities; one with health - Michael Reese Hospital in Chicago; one of a cultural nature - the Lincoln Center in New York City; one with research - the Salk Research Center in San Diego.

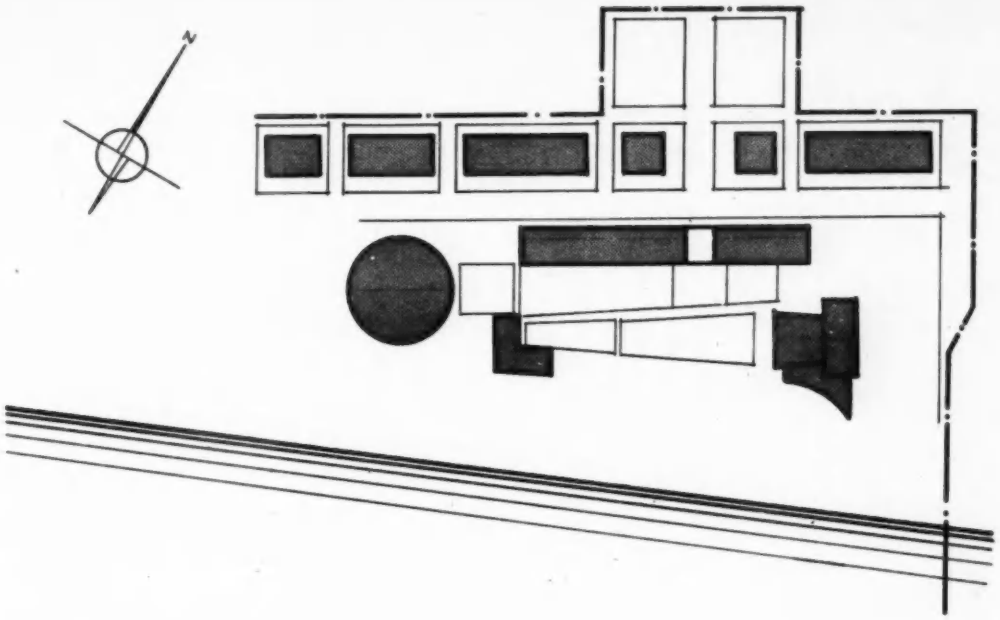
5. A short summary follows of the conference critiques on each of these projects, followed by general conclusions. Each project discussed concentrated upon a different point, not necessarily confined to that particular scheme. In the case of Detroit the main issue raised was that of vastness, In the case of the Charles River universities the topic was the use of high rise buildings on the waterfront. Micheal Reese Hospital initiated a discussion on controlling overall design by demanding that each architect set his project in a clearly articulated frame. Lincoln Center's discussion opened on the proglem of committee control, but continued with the problem of designing for ancillary functions. The Salk Research Center sparked off a discussion of the values of a strong "image".

6. Government: The Detroit Civic Complex. A plan for the Civic Center was prepared in 1945 by Eliel and Eero Saarinen. Whatever the other merits of this plan, it was based on a clear separation of automobile from pedestrial areas. This plan was not followed in many of its essential aspects, and this quality was lost. As Macklin Hancock said: The center as it stands suffers from a great dichotomy of purpose, the lack of resolve between the vehicular and pedestrian activities. At present the expressways cut across the site at grade preventing proper pedestrian and visual contact of the people within the city core." Or as Blanche van Ginkel put it: "The center should be a continuation of the pedestrian fabric of downtown Detroit".

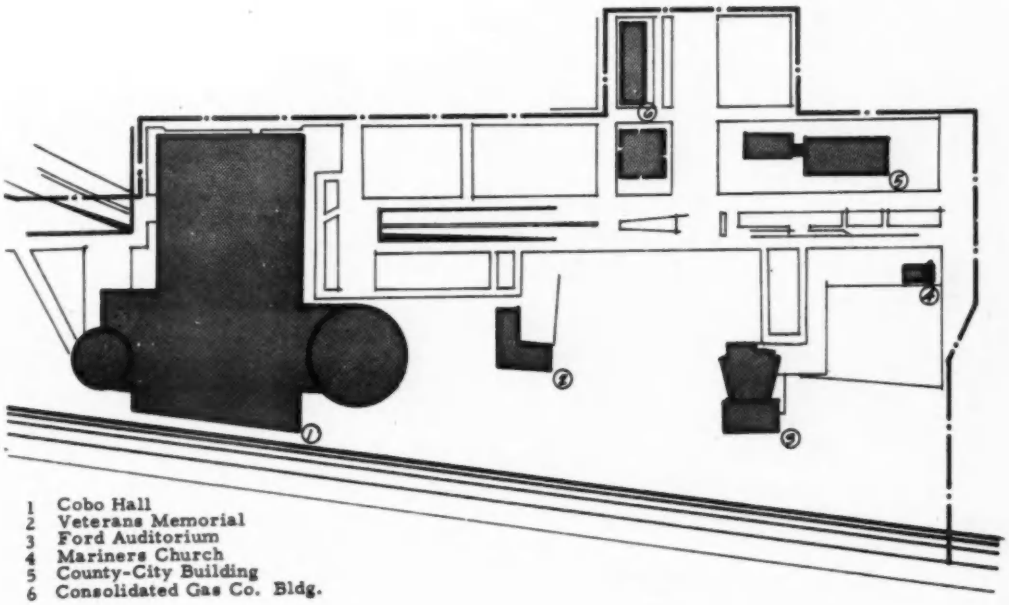
7. Jacqueline Trywhitt felt that the plan lacked consistency within itself, stating, "Part is designed to an auto scale: the Convention Hall and Jefferson Avenue. Part is intended to operate at pedestrian scale: the Ford Auditorium and the boat landing. The civic buildings themselves are unrelated to either, and the spaces between have been permitted to become pointless and barren."

8. Albert Szabo saw the center through the eyes of the pedestrian in the area and considered it would produce, "three negative reactions: Jeopardy, vastness and lack of direction. The sense of jeopardy results from the presence of a steady flow of traffic contiguous with what is set aside as predestrian domain. The sense of vastness results from the relative absence of a sense of arrival, place and detail that a pedestrian can readily identify himself with. The sense of lack of direction results from the lack of an obvious focus or foci or readily identifiable planned differences in the qualities of spaces and structures."

9. Blanche van Ginkel felt that this all-too-common error may have come about because "the current method of studying proposals by means of block models is frequently misleading. The eye tends to rely on the scale of the building masses in perceiving the scale of spaces, i.e., the building is used as the measure of the space. Another visual measure is needed in a study model to effect the translation from representation to reality. This should be an object of pedestrian scale -- the most obvious being the man on foot himself or a familiar element for the use of the pedestrian like a



Saarinen's scheme



1 Cobo Hall
2 Veterans Memorial
3 Ford Auditorium
4 Mariners Church
5 County-City Building
6 Consolidated Gas Co. Bldg.

general development plan

DETROIT CIVIC COMPLEX

step or a bench. If the inclusion of such elements is imaginative, the study model would have to be built to a large scale and this in itself might convey a truer visual image of reality".

10. Oscar Stonorov observed that in a suburban community the tendency is to drive your car downtown once. When you are once there you want to part it and do everything from that point of centrality and not get into the car again to go to another location for another aspect of the evening. This notion gave a sort of functional directive for design. John Papaioanneau stressed the important point that the design ought to clarify the structure of the whole downtown area. Then David Wallace moved from criticism to suggestion by stating that, "The space within the Center is now formless and scaleless, but a good skeleton has been erected in the right place. The space must be broken up into smaller spaces at the pedestrian level to give it scale by creating subareas.

11. The problem was then posed as to the functions that could be added to give life and purpose to these pedestrian spaces. The Detroit Civic leaders had recognized that, in addition to the function generated by the Civic Center in the area adjoining it (such as a gas company building now under construction, and a proposed hotel and Federal building) new and interesting activities had to be developed near it for convention visitors. To meet this need the idea of an "International Village" was developed, consisting of foreign restaurants, consulates of foreign countries, office buildings, etc.

12. The panel unanimously recommended that the International Village be located in the Civic Center bolstered by other uses similar to the Festival of Britain or Tivoli in Copenhagen; facilities for excursion boats, yacht landings, etc. These uses should be given good pedestrian connections with Cobo Hall and the hotel. As Vitruvious said 2000 years ago: "The size of the Forum should be proportionate to the number of inhabitants, so that it may not be too small to be useful, nor look like a desert waste for lack of population."

13. Among further points raised in open discussion, Don Grahm of the Boston Redevelopment Authority commented, "The question of the relationship between buildings and open space has also been troubling Boston. In Boston we are talking about a million square feet for the federal building alone. If you put blocks down on a model you tend to end up with a space which looks better on the model than it does on the ground. One suggestion is that we should not try to think in terms of a formal plaza but of an informal common: not try to think of a lot of activity that can make a focal space but simply make a pleasant relaxing place for workers in the buildings around: in effect abandon the idea of making this space a center of activity." M. Hoppenfeld then asked, "Is it possible that the very concept of the civic center is in a way anachronistic? The very things which have been chosen to go together may possibly not belong together. What relation does a war memorial have to Cobo

VIEW OF SITE LOOKING EAST TO COBO HALL

VIEW OF SITE LOOKING SOUTH TO FORD AUDITORIUM

Hall, or the city hall to a concert hall? I wonder if these individual elements don't have a more natural relationship to other parts of the city and that, if we thought of these as life-giving elements, the open spaces that go with each element might find a more natural expression instead of the kind of formalistic expression which we have been giving to civic centers.

14. Education: The Charles River Universities - Harvard University, Massachusetts Institute of Technology, and Boston University. During the panel discussion there was a general consensus on the following points:

a. That the Charles River Basin presents an unusual opportunity to create a total design which would give an imporving framework for the institutions on its banks.

b. That an overall design should be produced, possibly by an outside group, in close collaboration with the institutions, the City of Cambridge and the City of Boston, to take advantage of the unusual opportunitites for the creation of an image to shape an objective for planning action and to give the institutions a valid framework for their detailed planning design.

c. That an overall traffic plan is of paramount importance and that it should be an integral part of such a design.

d. That the development along the Charles River need not be institutional but should be sympathetic and complementary to the institutions.

e. The the educational institutions should be the generators of a new urban form and should provide the leadership together with the civic leaders of the communities for a rehabilitation of the Charles River Basin and the adjacent communities.

15. Furthermore the role of the architect was discussed. IT was pointed out how difficult it was to persuade the architect to further the planning objective, that every architect wants to be the prima donna, but that he is rarely willing to be the supporting cast. However, it was agreed that a strong overall design would go a long way towards the solution of this problem. Thus, in conjunction with some controls and such devices as review boards would assist greatly in shaping a strong urban form.

16. In addition to these general considerations, the majority of the panel agreed that the desire for concentration in our expanding institutions maked the use of high rise buildings necessary. However, the high rise buildings should take the form of towers which would complement the general horizontal development and would not become barriers in the total composition and that the unifying element in the total composition should be a system of open spaces.

17. In the open discussion the question of high rise buildings was the main topic. M. Hoppenfeld said, "Up until quite recently, the tall buildings in the Boston and Cambridge area have been somewhat omniscient --

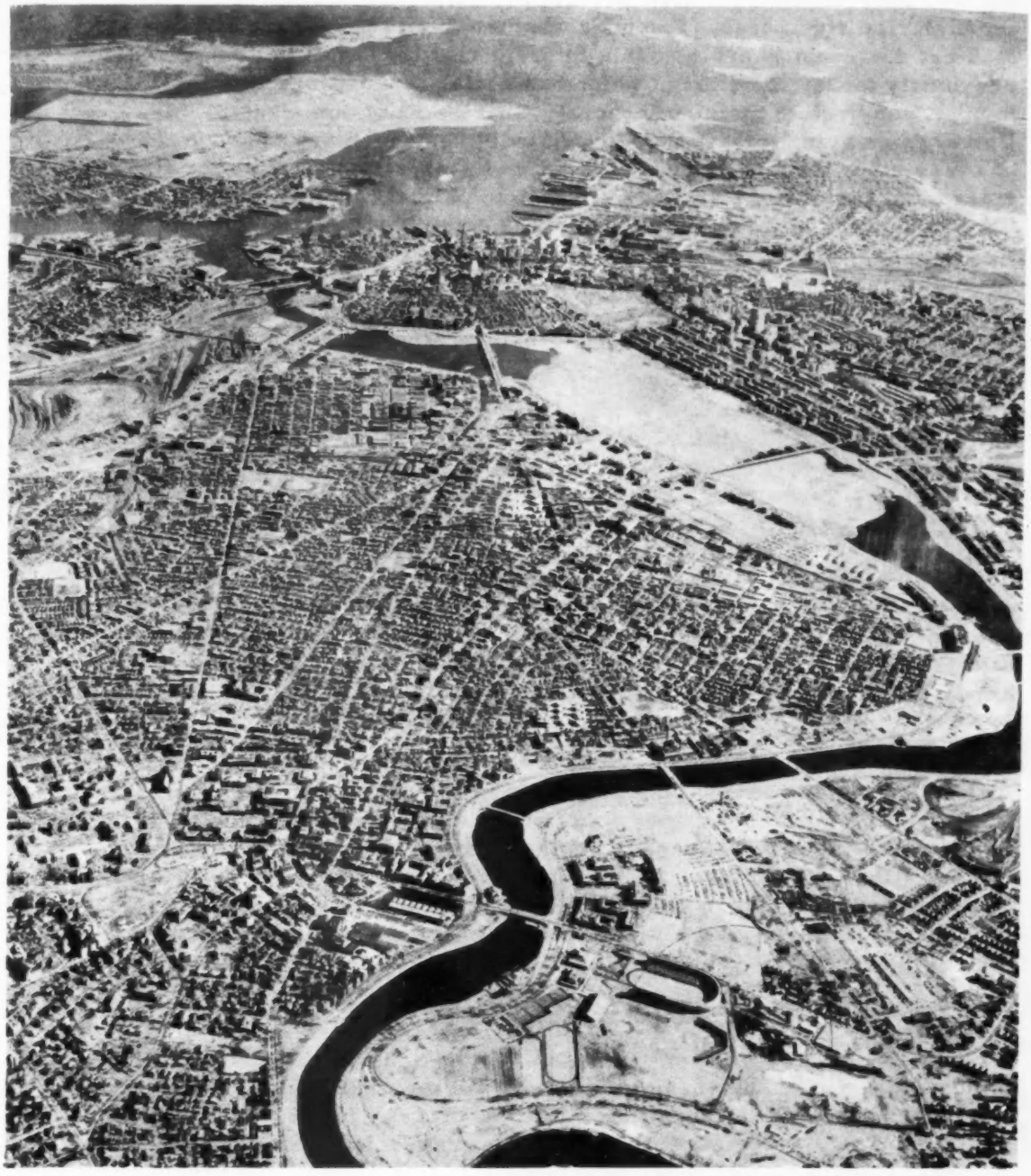


photo: Fairchild Aerial Surveys, Inc.

THE CHARLES RIVER

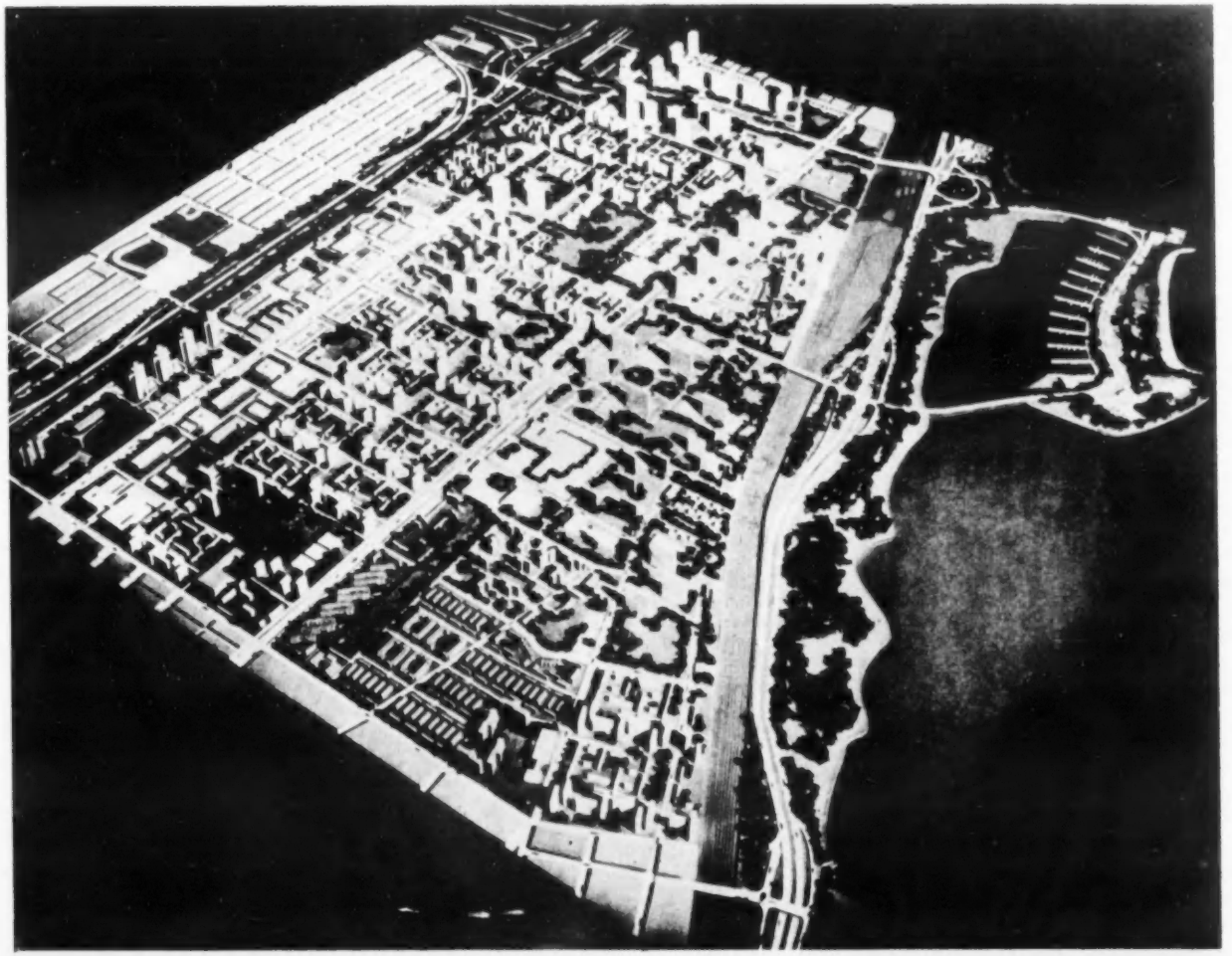
the churches. But now Boston University, MIT and Harvard are building high rise structures. I wonder whether this is necessary and whether it is not desirable to prohibit this in order that those tall buildings which previously meant something, which had social connotations to the community, may retain their eminence." Charles Eliot commented "Are Universities going to have flat-topped buildings which are also a symbol of every other modern activity? What can we really substitute for the spires and cupolas of Harvard?" S. Mintz pointed out that, "Since Harvard in building towers, the people of the community are worried about these towers further encroaching along the Charles River banks giving them absolutely no view or recreation connected with the river. These people feel a terrific animosity toward the universities because they don't understand why they need to build towers."

18. Dean Sert wound up the discussion by stating, "There are two ways of intensifying the use of the land: one is by covering the surface of the land with more small buildings close together, the other is by going up in height and liberating areas on the ground. I believe that the Charles River basin with its tremendous sacle can allow for tower structures. If there was a solid series of towers, I think there would be a terrible danger. But if the towers are widely spaced and between them there are low buildings and open space, then I think towers can provide more space and more view toward the river, than you would ever have if we had medium-height buildings. But I don't think any tower should be allowed unless it is part of a rather large development that can offset any difficulties it may offer by the provision of open space, parking, low buildings, etc.

19. Health: Michael Reese Hospital, Chicago. By the end of World War II, the South Side of Chicago contained America's largest contiguous Negro slum. It also contained some of Chicago's important institutions, including Michael Reese Hospital (a major medical and educational institution), Illinois Institute of Technology, and buildings of historic and architectural importance by Richardson, Sullivan and Wright, all of which characterized Chicago as a truly American city, youthful, brash and vigorous.

20. Michael Reese Hospital drew together the interests of itself and Illinois Institute of Technology, both of which needed to expand. It had large capital investments, a competant professional staff, and wished to provide a better environment for those it serviced. They looked at the housing conditions, recognized the threat to their own professional staff and patients and decided to meet the formidable problems head on.

21. The panel reviewed the concepts developed and the results achieved. One of the aesthetic attributes of Chicago is the edge of the city clearly defined by the waterfront. Here lies the key for the internal development of the city's parts. Assuming development on a project basis, a distinct edge should be maintained around each project's boundaries, then the internal structure of the project can be a matter for the individual designer, Most of the design of the South Side has lacked such definition, resulting in an incomplete visual image. As staged, it will not be visually complete until many more projects are constructed as part of an integrated plan.



CENTRAL SOUTH AREA
MODEL LOOKING NORTH
FROM LAKE MICHIGAN
SOUTH OF 40th STREET

22. Many problems of the South Side plan lay in the design implementation. The planning program was conceptually valid, but the design profession lacked the maturity to handle urban problems. Recognizing the fact that they were unable to cooperate on a group basis, they should have accepted their professional responsibility and defined the edge of their several project areas to result in a relation of square and rectangular superblocks. For example, Prairie Shores Apartments produced a mass which was destructive both to the human scale of the area and to the scale of its parent institution, Michael Reese Hospital.

23. The problem of control of projects by the city to insure that the end product will be worth the public expenditures was raised. The panel looked at the requirements which could be enforced. These included provisions for required open space, coordination of design on both sides of the road (the 'edges') and quality control for urban densities. It was also suggested that all developers be wedded to a design team and submit a detailed prospectus to which they would be committed. This would form an integral package in the design process which would be inseparable.

24. The Michael Reese hospital was the agent for generating the following:

a. Expansion of another hospital, Mercy Hospital, to the north;

b. Involvement of a religious institution, the Catholic Diocese;

c. Development of a research center related to I. I. T.;

d. Proposed office facilities for doctors;

e. New patterns of residential living in the urban setting;

f. Public and private housing which met the white-negro problem and was integrated;

g. Housing for professionals which attracted many middle and higher income people to the area;

h. Community facilities to serve the upgraded population;

i. Adequate park land to serve the population;

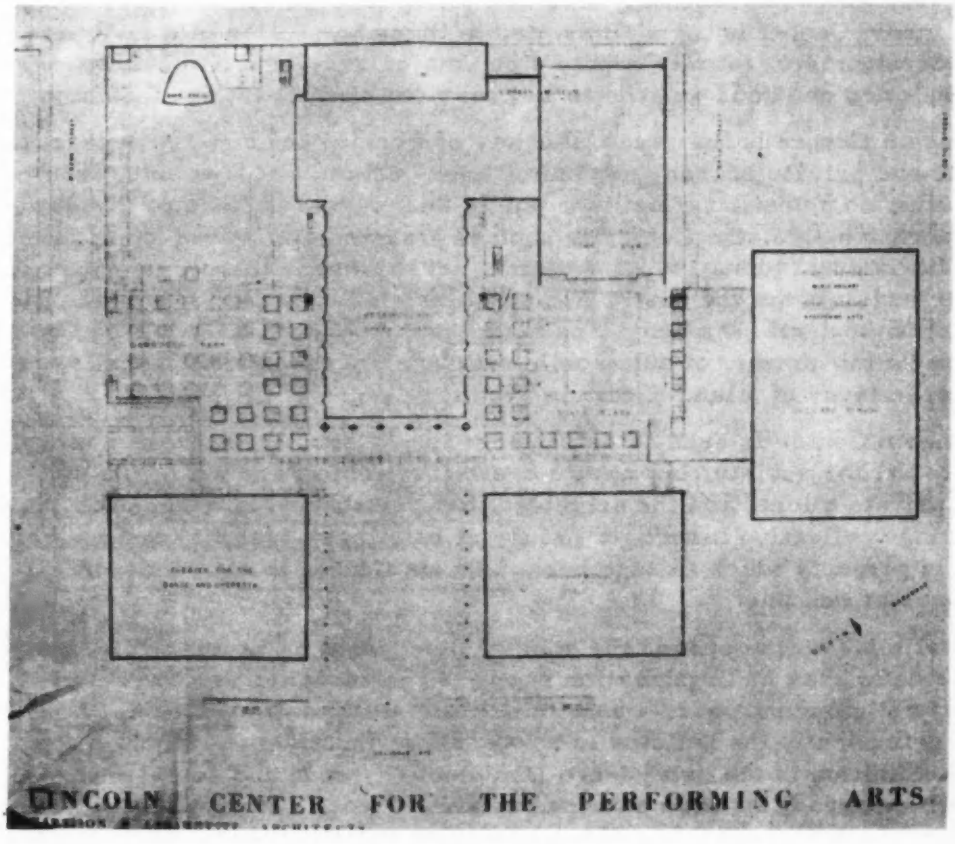
j. New legislation for housing and redevelopment;

k. Negro-white integration in hospitals.

25. In the open discussion Elizabeth Wood stated: "I think whats bothering me most during this discussion is the question of the responsible parties for the thing which is the image. Who really should be held responsible for the image of each of these complexes? It seems that the hardest thing when you are dealing with urban design is to assign the responsibility and authority for this thing which is the image -- the program that has within its compass not merely an aggregation of buildings with an aesthetic interplay but a social entity as well."

photo: Ezra Stoller

VIEW TOWARD OPERA HOUSE FROM COLUMBUS AVENUE



PLAN

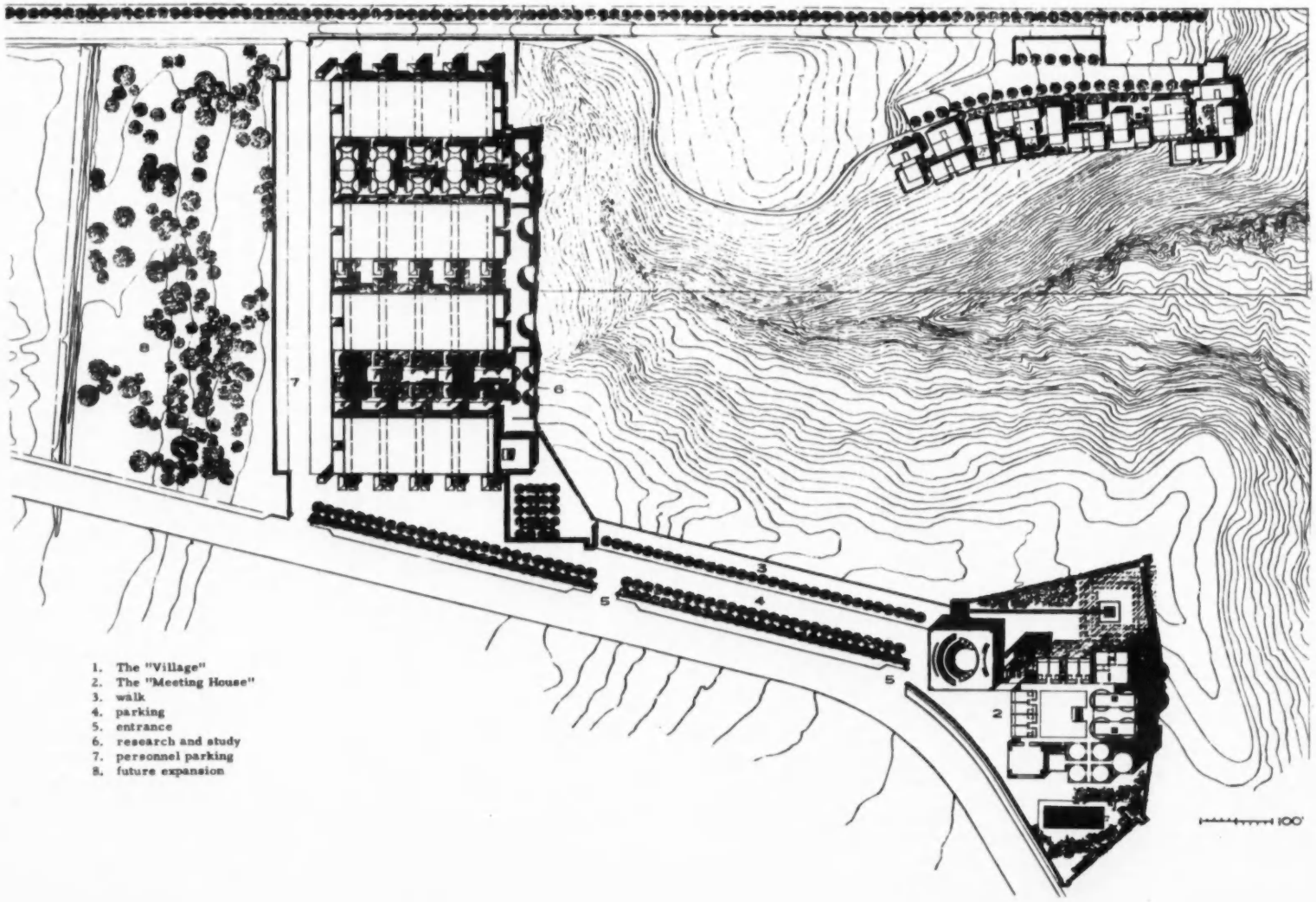
26. Reginal Issacs continued, "All planning projects are lost opportunities and I wonder why. What goes wrong? I blame it on the architects who are commissioned to do the projects, not the city planners who provide the framework or the urban designers who set the image of what it might be. Here you have an institution with great social ideals and you have a plan, at a time when the city of Chicago did not. There are consultants such as Walter Gropius in architecture, Walter Blucher in planning, Louis Wirth in sociology, not to mention half a dozen Harvard graduates; and something goes wrong. I blame the egocentricity of architects. Perhaps an architect cannot be a great designer unless he has a touch of megalomania, unless he wants to build monuments for himself. Sasaki's idea grew out of this: architects being what they are these huge superblocks should be turned over to them with strict instructions that they build a very sharp edge, so that the relationships between these rectangles become those of their boundaries. Maybe this is the only possible pattern until the architects themselves are willing to collaborate." Macklin Hancock concluded by suggesting that, "A landscape architect, such as Sasaki, is the missing link in this kind of development. The landscape architect can mold the interests of all kinds of conflicting personages and pull them together into a single integrated design."

27. Culture: Lincoln Center, New York City. Lincoln Center is isolated in a city which has no comprehensive plan. Within its immediate area, Lincoln Center is not well related to the possibilities of a river-to-park redevelopment, to over twenty other major unrelated neighborhood projects, or to demands on streets and services that threaten congestion.

28. Lincoln Center is the result of a way of working through the bureaucracy of public and private boards and committees. On the positive side, it is seen as an active combination of both the public and private sectors of investment. On the negative side, the Center is seen as a systematic way of compromise, so that the current plans, while certainly not the worse that were proposed, are still certainly not the best. The site plan, for example, is formalistic and axial without real meaning, and neglects the possibilities of organic expression (of movement, of automobile entrance, of the variety of halls and theaters) in favor of a land of facade architecture.

29. Lincoln Center is seen as a challenge to our society, no longer merely to create art for society, but now to create the society for art. The public and private client, and the architect, both must face up to the problem of creating "collective form", of groups of buildings which fit together, of groups of projects which fit together. Lincoln Center is not successful in these ways of building.

30. Martin Meyerson opened the general discussion by saying, "The Institution is defined as an organization having some social, cultural, educational or religious purpose -- a definition that dealt with function. A second definition is the building to house these functions -- which is form. A third definition is the established law, custom, code and so on; what our English friends so often call the "establishment'. In our discussion of Lincoln Center, I think possibly more than anywhere else, we have seen some of the conflicts between these three themes of function, form and establishment. Here we were trying to adjust for particular cultural purposes,


1. The "Village"
2. The "Meeting House"
3. walk
4. parking
5. entrance
6. research and study
7. personnel parking
8. future expansion
100'

PLOT PLAN

a limited space, and certain constraints upon buildings. But dominant were other kinds of institutional arrangements: a planning commission with no master plan; a group of donors who were trying to run Lincoln Center as a business enterprise with men of affairs, who as someone has suggested are not necessarily men of taste. And in the process one almost had not choice but to have a design panel. This was composed of very capable people subject ot a great variety of pressures. The problem is how, given these constraints and the institutional problems of establishment, do you achieve some unity from such diverse elements.

31. Eliot Rothman considered that "to pull all the cultural facilities in the city into one place disregards what these individual institutions generate. They generate such things as a housing for the underpaid actors and students and other things which cannot be accommodated at this site in New York City. Robert Weinberg disagreed: "All the institutions participating in the Lincoln Center superblock are presently located in areas where they neither have provisions for underpaid actors nor have they had any effect over the last sixty or eighty years on their surroundings. This thing could happen, but it has not happened in the past and there is no reason to suppose that it would necessarily happen if the institutions were isolated as the last speaker mentioned." But Jacqueline Tyrwhitt responded, "Because something is not architectually evident, it does not mean that it is not there. Those of us who count music among our interests will know that around Carnegie Hall there are very many practice rooms, places where musicians live, music shops and dance studies. They are not occupying very attractive architectural structures because they are not able to afford that kind of thing. I think one of the problems when we create a formal design, is where these anciliaries that require a good deal of space -- cheap space -- are going to be. And they are absolutely necessary if the active life of the Juilliard School or the Symphony is to continue."

32. Martin Meyerson concluded, "This point relates to all the institutions with which we are dealing. When you have universities you also have student's lodging places, you have tap rooms, and all the other informal leasure time activities of a student group. When you have a government center you have the lawyers and all the camp followers of public service and so on for each of the major institutions with which we deal. One of our deficiencies in planning and design is to really take account of these links and inter-related uses."

33. Research: Salk Research Center, San Diego, California. This project, designed by Louis Kahn, will house 225 scientists, technicians and visiting scholars. The research center is located close to the road and is linked by both a pedestrian walk and a drive-way to the "meeting house" and to the "village". Both distances are around 600 feet. The same distance separates the village and the meeting house across the valley, but these are visually linked by the natural feature of the site.

34. The arguments centered around the question of isolation from the environment versus the integration into it; the desirability of a relationship with San Diego and the region versus the idea of seclusion to fulfill the inner law of the institution and to preserve the inherent beauty of the site and its environment. Would not San Diego, with its over 500,000 population just swallow this institution?

35. Kahn says that he considers separation so important that he has tried to explain and express it in many different ways. Its most distinct expression -- the fortification-like enclosure around the meeting house -- will have the most positive impact on the environment just because it reinforces the integrity of the landscape. Moreover, the radiation of the institution on the environment will be the strongest when the idea of separation is as distinctly stated as the image of a monastery.

36. Doubt was expressed whether San Diego misses an opportunity of building a strong university complex by not integrating the research centers into the planned university. But it was felt, that the tension between these institutions, resulting from their separation, would help to develop a sense of loyalty of the population living in the adjacent areas. However, why should one not try to obtain this objective in a location closer to San Diego? Why distribute city functions to a suburb when downtown suffers thereby? George Kostritsky, in particular, defended a downtown location, as every element which helps to identify downtown, would strengthen and widen the meaning of downtown. It is there where the institutions have the strongest possible impact on the population and it was around them where man traditionally developed a sense of belongingness.

37. Another kind of planning would stimulate institutions to create a life of their own so strong that they dominate and shape the community. These powers are intangible but there is the hope that these symbols will shape the urban scene and again become the great form givers which they have been in the past.

38. Christopher Tunnard opened the discussion by saying, "Dr. Wall suggested that this project was really a kind of oasis and an escape from modern life and Lou Kahn himslef has stressed the monastic aspect of the scientists life and of how he would like to encourage it. But the bigger question of the total urban form of the region did not seem to be resolved." Robert Sturgis considered, "There is a strong possibility that the Salk Research Center with its subsidiary residences will act as a positive lement, in perhaps the same way that Harvard existed in 1640 with relation to Boston, and that by its spiritual nature could control the future urban environment of San Diego.

39. Ernesto Rogers commented, "We cannot refute the benefits, or whatever we wish to call them, of the machine era, but we have to find a new space feeling and a new architectural idiom. We have to solve culturally (which means poetically) the effects of the machine era. We have to create a new quality in our design and this quality is, I think, a spiritual density. The project Dean Sert is doing for a health center here in Cambridge and Louis Kahn's research center near San Diego are two different examples of spiritual density. One is a problem in a town, the other in open country.

Both are so finely designed that they will not only have a real effect on health but also on their surroundings. Good things always change the forms near to them."

40. Ed Bacon wound up by saying, "I think the most profound question that can be asked is where is the image which, as a generative force, will itself influence what happens after it. The chairman stressed the lack of quality image in the minds of national leaders but if anyone does produce an image and puts it forth in a really clear fashion, it is positively astonishing how effective it is and how many people rally around it."

41. Conference Conclusions. William Doebele commented, "There has been very little discussion about the institution as a generator of form. We have spoken of it as a generator of ancilliary functions and functional relationships, but not of it as a generator of form of the entire urban environment. It is rather interesting that in Lincoln Center, insularity is treated as being a great sin - a vice of that project. In Michael Reese, on the other hand, insularity is mentioned as a virtue. Perhaps we are reaching a stage when the need is not to consider specific areas or specific institutions, but rather to conceive urban design as a design plan for the entire community. Many of these problems that seem so difficult and vexing to us today can really not be solved until we somehow move into the larger scope of seeing the entire community as one visual whole, with the institutions as but one important element in this. I am not suggesting urban design be amalgamated somehow with city planning, but I am suggesting that, in terms of design itself, it may be important to give at least some of our time and some of our attention, to the design of the total community as the next step.

42. Jacqueline Trywhitt said, "Missed opportunities seem really to have been the theme of what we have been discussing in our five projects. Another phase of general significance was used by Elizabeth Wood. She talked about "large scale Images which seems a good frame of reference of what is urban design. One great dilemma stands out in almost every project. Whenever faced with a really large open space the design seems to have fallen down. We have seen large tracts of water: The Detroit River; the water-front at Chicago; and the smaller-scale Charles River. A relation with these large open spaces has never really been a built-in factor of the design. And yet those spaces are the most dominant element in those environments. Not only is the space there, but very often there is something across the space. When you go down to the water in Detroit, the thing you see is not Detroit but Windsor, Canada, across the river. Its the same when you go down to the waterfront along the Charles River. The things you see are the backs of Back Bay houses and the towers of Boston University. This didn't get built into the discussion and it has certainly not got built into the design. Railroads and highways have similar characteristics and they were ignored in the urban designs. When we get to handling things on this scale, somehow we fail. We prefer to go right to the other end of the scale, the pedestrian scale that Ed Bacon has made so famous, and consider the use of greenways as a means of handling urban design. This is obviously very attractive when its at the scale of Harvard Yard, but I think we have had enough instances to show that the pedestrian way is not a strong enough cord to tie urban design together."

Jacqueline Tyrwhitt continued, "Then we come to something quite different in form of solution: the idea of deliberately building ghettos. I remember when the plan for Chandigarh was first discussed. Chandigarh consists of large rectangular superblocks, each half a mile by about a third of a mile, surrounded by a low brick wall. It was Corbusier's idea to make a distinct separation between the lines of fast moving traffic and large internally planned pedestrian scale areas. But it was the notion of enclosure that first hit the Indians. And now, under very different conditions, we are hearing another version of this notion deliberately advocated by some of those very people who have been most strongly against deliberate enclosures of social groups. I am sure this is not done willingly -- its done because we are driven to some conclusion of this kind of a design situation. It may lead to a way out, but its a way I take very reluctantly.

44. In winding up the conference Dean J. L. Sert said, "There has, perhaps, been too much emphasis on the form of the container and we have forgotten the contents, or the roots of many of the things we have been discussing. I believe that all panels should start by trying to discover what is really behind the facade. I think we are again falling into what can be called "facade-ism". I am old enough to have gone to a beaux arts school and I remember all its dangers and pitfalls. The young unfortunately have not gone through that so they are unconsious of what they are driving toward. But it is very dangerous and the essence and the motivation of these projects is very important. If they are not really to answer to certain human problems they are empty of content and possibly are born dead. This applies to any kind of development no matter how well designed it may be and I don't think there is an opportunity for really good design if there isn't a really good program behind it.

45. "An architect has to be, by definition and interest, a man who can act and find solutions. Architecture is an act of faith and you must take the direction you believe the best after having properly studied the situation. The architect and architecture very surely finds its death in compromise and committee work."

46. "Urban design has to be the result of teamwork. But teamwork is not duplication or hesitation. It is a work in which the abilities of one man is added to the abilities of others to lead to better results. Finally, like the instruments in a string quartet, they come in and out at the right times so that the final result is one of addition instead of subtraction."

47. "I slightly disagree with Jacqueline Tyrwhitt's alarm at the clean-cut edges of a design. In her mind I think there may be a certain confusion or identification with the forming of design ghettos and the social functioning of the whole. These schemes, although their design forms may be very different, could live very happily together. If we can keep clean-cut edges in terms of design, we can have different approaches and different interpretations of similar programs and still keep the results uncompromised. Today cities are cut by the new expressway system into very firmly defined sectors. Within the belts of the expressways I think we can look toward the inside and create in those areas a better environment for man. I think that should be our goal."